9. Overthrust Mountains Section

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Section Description

The Overthrust Mountains Ecological Section is part of the Utah-Wyoming Rocky Mountains Ecoregion. The Idaho portion of the Overthrust Mountains, the subject of this review, comprises much of southeastern Idaho, from the Snake River Range in the northeast, west to the Bannock Range, and south to the Idaho-Utah border, not including Bear Lake Valley in the southeast (Fig. 9.1, Fig. 9.2). Elevation ranges from 1,300–3,000 m (4,400 to 9,900 ft). Sedimentary rock formations, such as limestones, siltstone, sandstones, and shales, are predominant. Climate is influenced by prevailing winds and the general north–south orientation of the mountain ranges. Precipitation ranges from 40–100 cm (16–40 in) annually with most occurring during the fall, winter and spring. Precipitation occurs mostly as snow above 1,800 m (6,000 ft). The majority of precipitation falls as snow in the winter. Summers are dry. Annual average temperature is 2–10°C (35–50°F). The growing season lasts 80–120 days.

Landscapes of the Overthrust Mountains are characterized by minor mountain ranges and broad valleys. Mountain ranges include the Snake River, Caribou, Webster, Aspen, Portneuf, Bannock, and Bear River Ranges. Linear valleys and ridges are the products of thrust faults. Rivers are of two major drainage basins, flowing either into the Snake River or the Great Basin. Important rivers include the South Fork of the Snake River, the Portneuf River, portions of the Bear River and the upper Blackfoot River. A few lakes and wet meadows are associated with higher elevations above 1,500 m (5,000 ft). The aridity of this region requires water management programs, including water storage, delivery, and regulation of usage to support agriculture, which is generally irrigated with either flood or sprinkler irrigation mostly supplied by diversion from the Snake and Bear rivers. Major hydroelectric and water storage reservoirs include Palisades reservoir on the South Fork of the Snake River, Oneida Narrows reservoir on the Bear River and multiple small reservoirs scattered throughout the section.

Population centers are primarily along the Portneuf and Bear Rivers and include Pocatello and Preston. Approximately 70% of the land is forested, and timber harvest, livestock grazing, and recreation are major land uses. This section provides outdoor recreational opportunities for hunting, angling, trail-riding, hiking, wildlife viewing, kayaking, and river rafting. Phosphate mining is also an important land use in the Overthrust Mountains.

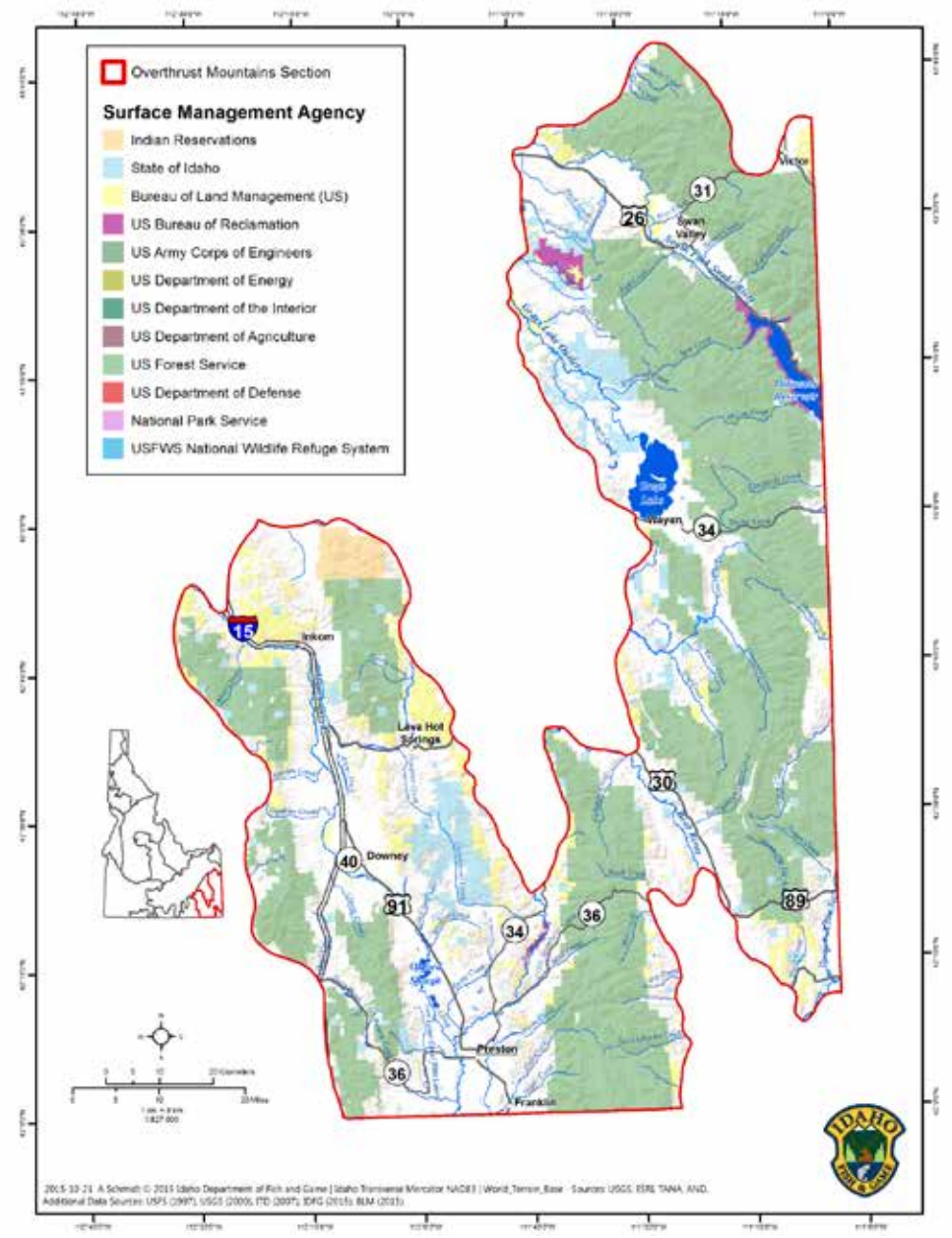

Fig. 9.1 Map of Overthrust Mountains surface management

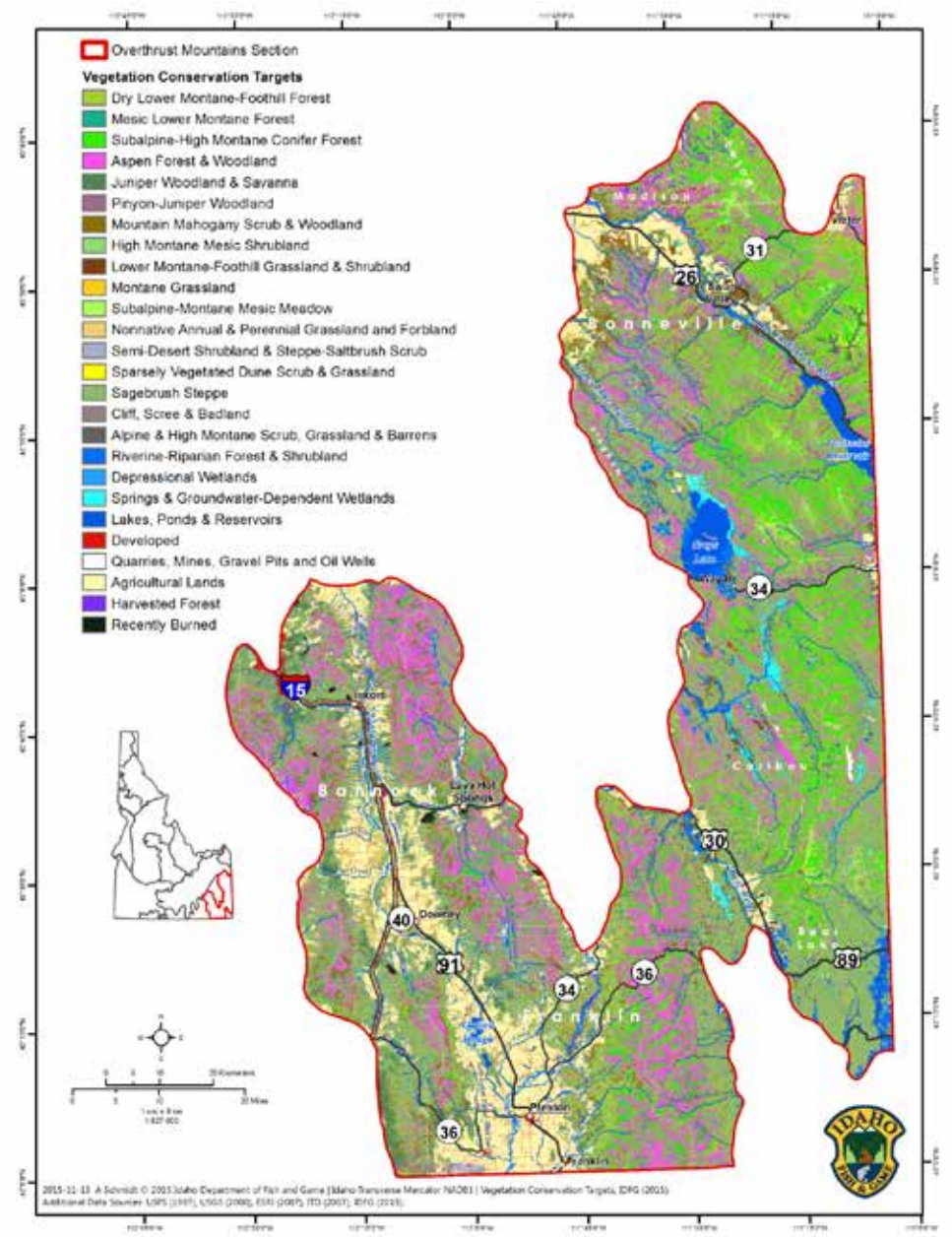

Fig. 9.2 Map of Overthrust Mountains vegetation conservation targets

Conservation Targets in the Overthrust Mountains

We selected 6 habitat targets that represent the major ecosystems in the Overthrust Mountains as shown in Table 9.1. Each of these systems provides habitat for key Species of Greatest Conservation Need (SGCN), i.e., "nested targets" (Table 9.2) associated with each target. All SGCN management programs in the Overthrust Mountains have a nexus with habitat management programs. Conservation of the habitat targets listed below should conserve most of the nested species within them. However, we determined that 2 additional taxonomic groups (Bats and Pollinators) face special conservation needs and thus are presented as explicit species targets as shown in Table 9.1.

Table 9.1 At-a-glance table of conservation targets in the Overthrust Mountains

Target	Target description	Target viability	Nested targets (SGCN)	
Aspen Forest & Woodland	Aspen Forest & Woodlands are dominated by open to dense canopies of quaking aspen (*Populus tremuloides*), some without a significant conifer component (<25% relative tree cover), others, depending on seral stage, may have high conifer component (≥25%). The understory structure may be complex with multiple shrub and herbaceous layers, or simple with just an herbaceous layer. The herbaceous layer may be dense or sparse, dominated by graminoids and/or forbs.	Good to Poor. Stands in some areas are healthy and regenerating naturally. In other areas, prescribed fires and mechanical treatments have resulted in successful regeneration and/or enhancement of aspen stands. Conversely, some stands once thought to be stable Aspen communities are disappearing, being encroached upon by conifers and maple, and lack a mosaic of age classes.	Tier 1 Tier 2 Tier 3	Grizzly Bear Sharp-tailed Grouse Silver-haired Bat Hoary Bat Kriemhild Fritillary Monarch
Dry Lower Montane–Foothill Forest	Over 11% of the Overthrust Mountains Section is comprised of Dry Lower Montane–Foothill Forest. This habitat target includes extensive Douglas-fir forests, occasionally with limber pine (*Pinus*	Fair. 70-80% of the Dry Lower Montane–Foothill Forest acres are classified as mature or old. For the most part, these forested areas are outside of the historic fire regimes, particularly for non-	Tier 1 Tier 2 Tier 3	Grizzly Bear Thin-ribbed Mountainsnail Hoary Bat Silver-haired Bat Lyrate Mountainsnail Great Gray Owl Little Brown Myotis Townsend's Big-eared Bat Western Small-footed Myotis Monarch

Target	Target description	Target viability	Nested targets (SGCN)	
	flexilis) and lodgepole pine (*P. contorta*). Extensive patches of bigtooth maple (*Acer grandidentatum*) are a common occurrence in areas of the Overthrust Mountains. Overall, this target often occurs at the lower tree line immediately above valley grasslands, or sagebrush steppe and shrublands.	lethal fires. Some past timber harvest practices, livestock grazing practices and suppression of disturbances, particularly wildfire, have created landscapes that are prone to more intense disturbances than in the past due to the buildup of mature and older vegetation.		
Subalpine–High Montane Conifer Forest	This habitat target includes the matrix forests of the subalpine zone. The tree canopy consists of Engelmann spruce and subalpine fir dominating either mixed or alone. Engelmann spruce can dominate sites (with minimal subalpine fir) in eastern Idaho where continental climate regime is most noticeable.	Fair. Engelmann spruce/subalpine fir communities on the Forest have been assessed as being at high risk. Approximately 80% of acres are mature and old, with increasing stand densities and ladder fuels. Engelmann spruce/subalpine fir is at risk primarily due to the dominance of mature and old age structure and changes in the historic non-lethal fire regimes.	Tier 1 Tier 2 Tier 3	Wolverine Grizzly Bear Hoary Bat Silver-haired Bat A Tiger Beetle *(Cicindela decemnotata montevolans)* Kriemhild Fritillary Monarch
Sagebrush Steppe	Over 30% of the Overthrust Mountains Section is comprised of Sagebrush Steppe that consists of communities of Wyoming and Basin big sagebrush (*Artemisia tridentata* ssp. *wyomingensis* and *A. tridentata* ssp. *tridentata*) at	Fair. Habitat is intact in some areas, but in others, altered and degraded by shrub removal and overgrazing, with low grass and forb cover and diversity. Conifer encroachment and development fragments sagebrush steppe habitat.	Tier 1 Tier 2 Tier 3	Greater Sage-Grouse Sharp-tailed Grouse Golden Eagle Long-billed Curlew Sage Thrasher Pygmy Rabbit Common Nighthawk Little Brown Myotis Townsend's Big-eared Bat Western Small-footed Myotis Wyoming Ground Squirrel A Tiger Beetle *(Cicindela decemnotata montevolans)* Monarch

Target	Target description	Target viability	Nested targets (SGCN)	
	lower elevations and Mountain big sagebrush (*A. tridentata* ssp. *vaseyana*) at higher elevations along with perennial grasses and forbs.			
Riverine–Riparian Forest & Shrubland	Lotic ecosystems (rivers and streams, including aquatic habitats and their associated terrestrial riparian woodland and shrubland habitats). Includes the South Fork Snake, Blackfoot, Bear, and Portneuf River systems. Vegetation directly adjacent to the South Fork Snake River and associated streams, dominated by narrow-leaf cottonwood with an intact and diverse understory in the Overthrust Mountains Section. Within the section, Yellow-billed Cuckoo habitat is associated with cottonwood habitats in riparian forests adjacent to the South Fork Snake River.	Fair. Within the Overthrust Mountains, the South Fork Snake River is impounded by a major dam that significantly changes the hydrograph (Palisades). Numerous smaller dams, largely for irrigation diversion or hydropower generation, also form impediments to water flow and animal movements elsewhere in the Overthrust Mountains. Riparian habitats associated with riverine systems, particularly cottonwood forests, are at risk and require conservation action.	Tier 1 Tier 2 Tier 3	Yellow-billed Cuckoo Northern Leopard Frog Harlequin Duck Trumpeter Swan Hoary Bat Silver-haired Bat Rocky Mountain Duskysnail Sandhill Crane Little Brown Myotis Western Small-footed Myotis Pondsnail Species Group *(Stagnicola Species Group)* Rotund Physa
Depressional–Groundwater-Dependent Wetland Complexes	In the Overthrust Mountains Ecological Section, both depressional and groundwater-dependent wetlands occur. However, in the context of this plan for the Overthrust Mountains Section, this target refers largely to Gray's	Fair. Semi-permanent and permanent wetlands, Gray's Lake and Oxford Slough, are managed as National Wildlife Refuges and are relatively protected, but seasonal and temporary wet-	Tier 2 Tier 3	Northern Leopard Frog Western Toad American Bittern Black Tern Long-billed Curlew Trumpeter Swan White-faced Ibis Franklin's Gull Sandhill Crane

Target	Target description	Target viability	Nested targets (SGCN)	
	Lake NWR and Oxford Slough, which can both be described as Depressional – Groundwater Dependent Wetland Complexes. In the Overthrust Mountains Section, this target also includes flood-irrigated habitats.	meadow wetlands and semi-permanent wetlands that occur on private lands have been historically altered by grazing or draining. Wetland habitats at Gray's Lake NWR are highly altered from modified drainage and altered hydrologic regimes resulting in habitat degradation. Flood-irrigated habitats are being converted to center-pivot irrigated fields which reduces the availability of flooded habitat for birds such as White-faced ibis.		
Bat Assemblage	There is an abundance of roosting habitat for bats in the Overthrust Mountains including abandoned mines, caves, forests, and anthropogenic roosts. Minnetonka Cave occurs in this section. Minnetonka is Idaho's largest and most popular show cave, with >33,000 tourists visiting each summer. Species at the cave include those that are potentially the most vulnerable to White-nose Syndrome (WNS). This site is a major hibernaculum for species such as Little Brown Myotis	Fair to good. Most known bat roosts currently occupied. Main concerns include fatality associated with wind energy, AML closures, and potential spread of WNS. Adjacent sections to Overthrust Mountains have multiple wind farms that have been shown to cause mortality of Silver-haired and Hoary Bat. Minnetonka cave could be an introduction site for WNS in Idaho, due to the volume of tourists visiting the cave. Although measures are employed to reduce the risk, this site remains a high priority for WNS	Tier 2 Tier 3	Hoary Bat Silver-haired Bat Little Brown Myotis Townsend's Big-eared Bat Western Small-footed Myotis

Target	Target description	Target viability	Nested targets (SGCN)	
	and Townsend's Big-eared Bat.	surveillance.		
Pollinators	Pollinators provide an essential ecosystem service which benefits agricultural producers, agricultural consumers, and gardeners (Mader et al. 2011) in the Overthrust Mountains.	Fair. Many pollinators, but particularly bees, are known to be experiencing population declines throughout North America and those declines may be occurring within the Overthrust Mountains as well. Population declines and local die offs occur for a variety of reasons including habitat loss, pesticide exposure, and climate change	Tier 1 Tier 3	Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Hunt's Bumble Bee Mason Bee *(Hoplitis producta subgracilis)* Monarch

Table 9.2 Species of Greatest Conservation Need (SGCN) and associated conservation targets in the Overthrust Mountains

Taxon	Conservation targets							
	Sagebrush Steppe	Depressional – Groundwater Dependent Wetland Complexes	Riverine–Riparian Forest & Shrubland	Dry Montana-Foothill Forest	Subalpine-High Montane Conifer Forest	Aspen Forest & Woodland	Bat Assemblage	Pollinators
AMPHIBIANS								
Northern Leopard Frog		X	X					
Western Toad		X						
BIRDS								
Trumpeter Swan		X	X					
Harlequin Duck			X					
Sharp-tailed Grouse	X					X		
American Bittern		X						
White-faced Ibis		X						
Golden Eagle	X							
Sandhill Crane	X	X	X					
Long-billed Curlew	X	X						
Franklin's Gull		X						
Black Tern		X						
Yellow-billed Cuckoo			X					
Great Gray Owl					X			
Common Nighthawk	X							
Sage Thrasher	X							
MAMMALS								
Grizzly Bear				X	X	X		
Hoary Bat			X	X	X	X	X	
Little Brown Myotis	X		X	X			X	
Pygmy Rabbit	X							
Silver-haired Bat			X	X	X	X	X	
Townsend's Big-eared Bat	X						X	
Western Small-footed Myotis	X		X	X			X	
Wolverine					X			
BIVALVES								
California Floater *(Anodonta californiensis)*			X					
GASTROPODS								
Pondsnail Species Group *(Stagnicola Species Group)*			X					

Taxon	Conservation targets							
	Sagebrush Steppe	Depressional – Groundwater Dependent Wetland Complexes	Riverine–Riparian Forest & Shrubland	Dry Montana-Foothill Forest	Subalpine-High Montane Conifer Forest	Aspen Forest & Woodland	Bat Assemblage	Pollinators
Rotund Physa *(Physella columbiana)*			X					
Rocky Mountain Duskysnail *(Colligyrus greggi)*			X					
Bear Lake Springsnail *(Pyrgulopsis pilsbryana)*			X					
Lyrate Mountainsnail *(Oreohelix haydeni)*				X				
Thin-ribbed Mountainsnail *(Oreohelix tenuistriata)*				X				
INSECTS								
A Tiger Beetle *(Cicindela decemnotata montevolans)*	X				X			
Hunt's Bumble Bee *(Bombus huntii)*								X
Morrison Bumble Bee *(Bombus morrisoni)*								X
Western Bumble Bee *(Bombus occidentalis)*								X
Suckley Cuckoo Bumble Bee *(Bombus suckleyi)*								X
A Mason Bee *(Hoplitis producta subgracilis)*								X
Kriemhild Fritillary *(Boloria kriemhild)*					X	X		
Monarch *(Danaus plexippus)*	X			X	X	X		X
Utah Sallfly *(Sweltsa gaufini)*			X					

Target: Aspen Forest and Woodland

Compared to coniferous forests, aspen stands are rich in understory shrubs and herbaceous species (Gruell and Loope 1974), making them particularly attractive to wildlife. Mitton and Grant (1996) suggest that in the arid West, aspen stands are second only to riparian areas in habitat importance. Well-managed aspen stands are high in biodiversity, so maintaining aspen communities is sustaining biodiversity. Aspen Forest and Woodlands are dominated by open to dense canopies of quaking aspen (*Populus tremuloides*), some without a significant conifer component (<25% relative tree cover), others, depending on seral stage, may have high conifer component (≥25%). The understory structure may be complex with multiple shrub and herbaceous layers, or simple with just an herbaceous layer. The herbaceous layer may be dense or sparse, dominated by graminoids and/or forbs. Aspen communities that are stable and self-perpetuating have individuals that are replaced by progeny without disturbance. However, stable aspen stands in the Overthrust Mountains Section are rare. Most Aspen stands in the Overthrust Mountains are seral, meaning they will be replaced by some other climax community

if disturbance (usually fire) is eliminated. A truly healthy aspen stand will be comprised of multi-aged stems ranging from new shoots to mature and aging trees. Significant standing dead trees will add to the diversity of the stand and the diversity of wildlife, particularly cavity nesting birds and bats.

Aspen grove near beaver ponds, South Fork Mink Creek, Idaho © Becky Abel

Although aspen management tends to focus on the aspen trees themselves, in reality, it is the native aspen community as a whole that creates all the benefits ascribed to aspen. The community that exists with aspen is as important as the aspen themselves. An aspen grove with a smooth brome (*Bromus inermis*) or Kentucky bluegrass (*Poa pratensis*) understory can be depauperate even though the aspen themselves may be healthy. A dense and vibrant understory promotes high wildlife diversity, forage production, water storage and erosion control. One important measure of appropriate understory structural and compositional diversity is whether it forms a recognizable native plant association as defined by Forest Plans, Resource Management Plans, or other habitat descriptions such as habitat and community typing (EIAWG 2014).

Target Viability

Viability of Aspen Forest and Woodland habitat in the Overthrust Mountains Ecological Section can be described as Good to Poor. Stands in some areas are healthy and regenerating naturally, in other areas, prescribed fires and mechanical treatments have resulted in successful regeneration and/or enhancement of aspen stands. Conversely, some stands once thought to be stable Aspen communities are disappearing, being encroached upon by conifers and maple, and lack a mosaic of age classes. In other areas where aspen is a seral species, it is replaced by conifer vegetation at alarming rates (Eastern Idaho Aspen Working Group [EIAWG], pers. comm.). Phosphate mining is an important land use in the Overthrust Mountains Section, and footprints of reclaimed mines will never again support aspen or other native plant communities.

As described in the 2003 Revised Forest Plan for the Caribou National Forest, approximately 40-50% of the aspen cover type acres are mature or old. Another 142,000 acres have succeeded to conifer, largely due to fire suppression, livestock grazing and natural succession. Over the past

100-150 years, there has been an estimated 40 percent decline in the amount of aspen acres on the Forest (CTNF 2003, p. 2-4). Continuing declines in aspen stands are resulting in both a reduction in the amount of aspen and a reduction in the quality of remaining aspen. As an early successional tree species, aspen is dependent on disturbance (often fire) and susceptible to overbrowsing. Where possible, aspen community health should be improved and maintained through restoration of the historical large scale fire regime and proper grazing to prevent overbrowsing and impacts to the understories. Declines in aspen communities will likely not be reversible without active management. The goal of management should be to restore and maintain long-term function of the aspen stand. Potential active management to restore aspen communities in the west includes reduction of conifer competition, stand rejuvenation, and control of overbrowsing by livestock.

Aspen in Southeast Idaho © IDFG

Prioritized Threats and Strategies for Aspen Forest and Woodland

Very High rated threats to Aspen Forest and Woodland in the Overthrust Mountains

Lack of disturbance

Aspen thrive on disturbance that restricts conifer invasion and reduces self-competition. However, disturbance that results in the loss of regenerative suckers is detrimental. In general, disturbance refers to natural or human-generated fire, logging, slashing, or other activities intended to reduce or remove conifer dominion over aspen and release aspen regeneration. Fire plays an important role in the maintenance of seral stages and stand structure. Aspen regenerates after fire or stand disturbances through root sprouting. Conifer invasion, or encroachment, commonly a result of wildfire suppression policies dating back 100 years and activities such as improper timing and levels of livestock grazing that remove fine fuels and surface litter needed to carry fire, is likely the number one reason for aspen decline. Further, studies on Aspen have determined that the transition from a fire-shaped ecosystem to one protected from fire results in profound changes in ratios of aspen to conifer and is the driver for changes in forest dynamics. In one study, conifer coverage increased from 15% to 50% and aspen decreased from 37% to 8% over a 100 year period (Gallant et al. 2003).

Objective	Strategy	Recommended Action(s)	Target SGCNs
Increase disturbance to return to historical ratios of aspen and conifer cover	Increase the number of acres of young age class/early seral stands Improve diversity of age class structure Protect, maintain and enhance remnant stands and high-quality stands	To the extent possible, Allow naturally caused (lightning) fires to play their role in the ecosystem by allowing them to burn (a.k.a. Managing wildfire for resource benefit) Prescribed fire Mechanical treatments Consider the implementation of relevant design features/mitigation measures described in the Aspen Toolbox prepared by the Eastern Idaho Aspen Working Group (www.EIAWG.org) and other guidance documents when implementing mechanical treatments and prescribed fire. Often these measures should be incorporated to prevent damage to existing Aspen trees and ensure survival of roots to provide for adequate suckering post treatment. (Cox et al. 2009, Bartos 2007, Shepperd 2000)	Sharp-tailed Grouse Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary

High rated threats to Aspen Forest and Woodland in the Overthrust Mountains

Motorized use in aspen forest and woodland

Outdoor recreation (hiking, camping, wildlife watching, photography, horse-back riding, motorized recreation) in the West is very popular, due primarily to large tracts of public land available for use. All-terrain vehicles, including motorcycles, ATVs, UTVs, and snowmobiles, are used by >27% of the population in the western U.S. (Cordell et al. 2005). Roads and trails, both managed and un-authorized, create management concerns and negative environmental impacts including creation of new pathways for the spread of invasive plants, soil erosion, displacement of wildlife sensitive to human and vehicle activity, habitat fragmentation, and sportsmen dissatisfaction.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Reduce road-related impacts on aspen stands	Agencies work together to improve/develop travel management plans on state and federal lands	Use existing roads and trails for management actions whenever possible. As opportunities present (such as during watershed improvement projects or other land management activities), close or relocate existing roads that are located in Aspen stands. Prioritize closures in areas with the highest road densities or disturbance concerns. Establish seasonal closures of roads to protect wildlife during critical timeframes (breeding, overwintering, etc.). Limit new road construction to the extent	Sharp-tailed Grouse Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary

Objective	Strategy	Recommended Action(s)	Target SGCNs
		possible. Where new roads are needed, avoid routing any segments through aspen stands unless there are overriding safety or resource issues. Roads and trails constructed to implement prescribed fire or mechanical treatment projects should be temporary and re-contoured and re-seeded after completion of the project; ensure there is funding identified and secured for rehabilitating the roads and trails after the project is completed. Temporary roads and trails should be blocked to prevent public use during the life of the project. All roads and trails, including temporary roads, should be monitored during and after the project for weed infestations using an early detection rapid response protocol.	
	Reduce/Eliminate unauthorized user-created trails and roads	Increase enforcement presence on state and federal lands. Increase funding to implement and enforce closures. Educate the public on negative impacts to habitat and wildlife. Pursue funding from and increase collaboration with partners. Prioritize enforcement in areas with the highest user-created trails and road densities or disturbance concerns. Close and rehabilitate illegally created trails as soon as possible after they are discovered.	Sharp-tailed Grouse Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary

Medium-High rated threats to Aspen Forest and Woodland in the Overthrust Mountains

Livestock grazing management that is inconsistent with aspen restoration objectives
Livestock grazing, when it exceeds the capacity of the resource, can negatively impact Aspen by causing stand failure through removal of suckers or young trees and/or bark damage to mature trees. Grazing impacts can also include depletion of root reserves, removal of fine fuels that would allow fire to carry through the stand, reduction in litter that protects roots, reduces erosion, and conserves moisture, soil compaction, and invasion of undesirable plants as desirable plants are reduced in quantity and/or vigor. Excessive grazing by livestock can

dramatically influence aspen stand regeneration. Kay (2001) determined that reducing grazing pressure on aspen could lead to improved multi-aged stand condition in stable aspen not suffering from conifer encroachment. Changing grazing management is often essential to slow aspen habitat decline. However, it may not reverse the decline if conifer encroachment is occurring. Management actions, coupled with improved livestock management will, in most cases, be necessary.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Livestock grazing management that is consistent with aspen restoration objectives and maintains healthy understory and potential for regeneration	Limit timing of grazing activities in Aspen to avoid habitat degradation	Grazing in aspen habitat should be avoided in the spring and fall; late summer grazing is the best time to utilize aspen stands Enforce timing restriction	Sharp-tailed Grouse Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary
	Limit intensity of grazing activities in Aspen to avoid habitat degradation	Aspen habitats should be lightly to moderately grazed at most and carefully monitored for appropriate use. Exclude livestock from Aspen stands that are degraded. Exclude livestock use from areas where aspen restoration or improvement projects have occurred until the objectives of the project have been met. (i.e., regenerating aspen can support browsing) On state and federally managed lands or other areas where grazing plans exist, ensure utilization criteria are not exceeded in Aspen stands. As with other sensitive areas (such as riparian zones) as soon as utilization levels are met, livestock should be moved to other areas (other pastures, etc.). Ensure that AUMs track with declining forage abundance in areas of conifer encroachment. Incorporate aspen guidelines from the Aspen toolbox into Allotment Management Plans (AMPs) and other site specific grazing management plans used on state and federal public lands.	Sharp-tailed Grouse Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary
	Limit duration of grazing activities in Aspen to avoid habitat degradation	Grazing pressure relief on Aspen regeneration should not be based on length of time but rather on sucker growth and development Salting and water developments should be moved well away from aspen groves to minimize the duration of time livestock spend in Aspen.	Sharp-tail grouse Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary

Noxious weeds and invasive annual grasses

Invasive plants, non-native plants that have a strong propensity to spread into native habitats, are a threat to aspen communities and to aspen restoration efforts. Some of these plants are noxious weeds. Others, such as Kentucky bluegrass and smooth brome, are preferred grasses for livestock but are extremely aggressive and can quickly dominate aspen stands. Aspen communities in particular may be even more susceptible to invasion because they have fertile soils, high moisture and are often situated next to higher moisture environments such as meadows, wetlands, and riparian areas. Aspen are also often disturbance-dependent, creating the exact environment needed for invasive species to invade otherwise intact native habitat. Humans are commonly the main vector for introduction of invasive species into new habitats. Seeds travel into the new area via equipment and clothing and active management may actually increase this threat if precautions are not followed. Seeds of some invasive plants are wind-disbursed and can easily invade a project if there is a seed source nearby and if the project opens the canopy and exposes soil. Invasive grasses planted adjacent to native aspen stands commonly advance into the aspen stands by seed and by rhizome where they can form near monocultures in the understory.

An example of conifer encroachment in an aspen stand in eastern Idaho © Terry Thomas

Objective	Strategy	Recommended Action(s)	Target SGCNs
Effectively control and restore areas dominated by noxious and invasive plants at a rate greater than the rate of the spread	Implement large-scale experimental activities to remove upland non-native invasive plants through various tools (DOI 2015)	Support the development of a framework for a national invasive species Early Detection and Rapid Response (EDRR) program (DOI 2105). Locate and coordinate installation of long-term studies and subsequent monitoring to test the efficacy of large-scale application of integrated pest management programs that include chemical, mechanical, biological, newly registered biocides, and subsequent restoration practices (DOI 2015). Explore the use of both herbicides and biological controls to control cheatgrass. Promote certified weed-free seeds/forage (Idaho Sage-grouse Advisory Committee 2006).	Sharp-tailed Grouse Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary

Objective	Strategy	Recommended Action(s)	Target SGCNs
		Ensure that all equipment and field clothing brought to project areas are free from weed seed Carefully monitor and treat project areas for weed invasion for at least 3-5 years post project. Do not plant aggressive invasive grasses and crops adjacent to aspen stands or include them in rehabilitation mixes	

Unknown status or causes of decline

Objective	Strategy	Recommended Action(s)	Target SGCNs
Increase monitoring for species with significant data gaps		Conduct inventories to establish baseline data from which occupancy monitoring can occur	Silver-haired Bat Hoary Bat Monarch Kriemhild Fritillary

Spotlight: Tree-roosting Migratory Bats

In Idaho, two species of bats exhibit migratory behavior, migrating out-of-state in the autumn to overwinter in warmer climates. Silver-haired Bat (*Lasionycteris noctivagans*) and Hoary Bat (*Lasiurus cinereus*) are migratory species that primarily roost in or on trees and are listed as Tier 2 SGCN. Silver-haired Bats are medium-sized with black or dark brown, silver-tipped hairs, and short, rounded ears. Females form small maternity colonies of up to 70 individuals almost exclusively in trees at least 15 m above the ground, including inside natural hollows and bird-excavated cavities or under loose bark of large snags. Individuals change roosts frequently, and use multiple roosts within a limited area throughout the summer; therefore, clusters of large trees are a necessary habitat component. Silver-haired Bats hibernate in hollow trees, under sloughing bark, in rock crevices, and occasionally under wood piles, in leaf litter, under foundations, and in buildings, mines, and caves (WBWG 2015b). Hoary Bats can be distinguished from all other Idaho bat species by a combination of their relatively large size, frosted fur with a "hoary" appearance, golden coloration around the face, rounded ears, and furred interfemoral membrane. Hoary Bats roost solitarily in foliage of both coniferous and deciduous trees, near the ends of branches, 3-12 m above the ground and usually at the edge of a clearing. The swift, direct flight of this species makes it easy to distinguish on the wing from most U.S. bats. (WBWG 2015a). Seasonal records of both species suggest considerable north-south migration, with animals moving to warmer, more southern climates in the winter. Hoary Bats especially are highly migratory, and some individuals migrate >2,000 km (Cryan et al. 2004). Wintering sites have not been well-documented and no specific migration routes have been discerned. Hoary Bats are often found flying in waves of large groups during autumn migration, whereas spring migration is apparently less organized (WBWG 2015a).

Fatality monitoring studies indicate large numbers of both Hoary and Silver-haired Bat are being killed at wind-energy facilities across Idaho. Wind-energy facilities in the West generally report lower bat mortality than other areas of the US. Recent analyses report a mean of 1.29 bats killed per installed Megawatt (MW) in western states (Hein et al. 2013). Surprisingly, a wind-energy facility located in eastern Idaho reported an estimated fatality rate of 7.04 bats per MW in 2012 for a total estimate of 557 fatalities over 3 seasons (Tetra Tech 2015). Reasons for higher mortality in eastern Idaho are poorly understood; however, higher mortality rates may indicate that wind-energy facilities in Idaho are located at important topological features that bats use during migration (Abel, pers. comm.). Because bats are long-lived with low reproductive potential, increased mortality of this magnitude is likely unsustainable and could result in the loss of entire colonies, loss of benefits to the agriculture industry, as well as additional state and/or federal listings.

Target: Dry Lower Montane–Foothill Forest

Over 11% of the Overthrust Mountains Section is comprised of Dry Lower Montane–Foothill Forest. This habitat target includes extensive Douglas-fir forests, occasionally with limber pine (*Pinus flexilis*) and lodgepole pine (*P. contorta*). Mountain mahogany (*Cercocarpus ledifolius*) and quaking aspen (*Populus tremuloides*) can also be intermixed. Extensive patches of bigtooth maple (*Acer grandidentatum*) are a common occurrence in areas of the Overthrust Mountains. Important understory components include shrubs such as mountain big sagebrush, snowbrush ceanothus (*Ceanothus velutinus*), rocky mountain juniper (Juniperus scopulorum), chokecherry (*Prunus virginiana*), Antelope Bitterbrush (Purshia tridentate), common snowberry (*Symphoricarpos albus*), mountain snowberry (*S. oreophilus*), Saskatoon Serviceberry (*Amelanchier alnifolia*), creeping barberry (*Mahonia repens*), and others. Graminoids include pinegrass (*Calamagrostis rubescens*), several species of sedges (elk sedge [*Carex geyeri*], Ross' sedge [*C. rossii*]) and fescues, (Idaho fescue [*Festuca idahoensis*], spike fescue [*Leucopoa kingie*]), bunchgrasses (bluebunch wheatgrass [*Pseudoroegneria spicata*]) and others. Forbs include yarrow (*Achillea millefolium*) arrowleaf balsamroot (*Balsamorhiza sagittata*) and many others in the aster family, including species of Phlox, Lupine, milkvetch.

Overall, this target often occurs at the lower tree line immediately above valley grasslands, or sagebrush steppe and shrublands. In the Overthrust Mountains section, Dry Lower Montane–Foothill Forest typically occurs in canyons and draws, especially in the Bannock and Portneuf Ranges to the west, with a broader distribution in the Bear River, Caribou, and Snake River Ranges to the east.

Target Viability

Viability of Dry Lower Montane–Foothill Forest in the Overthrust Section can be described as Fair. As described in the 2003 Revised Forest Plan for the Caribou National Forest, 70-80% of the Dry Lower Montane–Foothill Forest acres are classified as mature or old. For the most part, these forested areas are outside of the historic fire regimes, particularly for non-lethal fires. Some past timber harvest practices, livestock grazing practices and suppression of disturbances, particularly wildfire, have created landscapes that are prone to more intense disturbances than in the past due to the buildup of mature and older vegetation. Accepting that disturbances are inevitable,

as well as critical to ecosystem function, means management actions need to focus on making watersheds resilient to these disturbances over the long-term while reducing recovery time. As these forests continue to age, the risk and potential severity of disturbances increase (CTNF 2003). While disturbances are lacking in many areas, the presence of invasive plant species (such as cheatgrass and thistle), present a challenge to federal, state, and private land managers as attempts to enhance habitats can further the establishment of these species. If not carefully planned and executed, habitat improvement projects can inadvertently spread these species, potentially negating any benefits.

Prioritized Threats and Strategies for Dry Lower Montane–Foothill Forest

Very High rated threats to Dry Lower Montane–Foothill Forest in the Overthrust Mountains

Lack of disturbance

Fire-dependent habitats such as Dry Lower Montane–Foothill Forest were probably subject to a moderate severity fire regime in pre-settlement times, with fire return intervals of 30-100 years. Frequent, low–intensity fires maintain stand composition and structure. In the Overthrust Mountains Section, fire in this habitat has recently been infrequent. Emphasis on protecting property and a lack of understanding of the benefits of fire among the public has led to fire suppression. Fire suppression contributes to outbreaks of mountain pine beetle, widespread decline in habitat quality, and increased risk of large–scale, severe fires. The growth of the wildland/urban interface increases the risk of wildfire and places habitat at higher risk of loss through stand–replacing fires. This habitat tends toward mature seral stages and stands that are homogenous rather than have a mosaic of age classes.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Manage forests for a diversity of structure and composition. Maintain or restore productive and diverse populations of plants. Maintain conifer types and early successional stages and restore disturbance processes through vegetation management, endemic insect and disease disturbances, and fire.	Use methods of vegetation treatment that emulate natural disturbance and successional processes.	To the extent possible, Allow naturally caused (lightning) fires to play their role in the ecosystem by allowing them to burn (i.e., Managing wildfire for resource benefit; CTNF Management Plan 2003 p. 3-4) Implement a variety of vegetation management projects on federal, state and privately managed lands (these could include prescribed fire and mechanical treatments such as thinning, timber harvest, etc.) across the Section to return areas to early seral conditions. While a variety of benefits can be realized from these projects, restoration of proper ecological functions and benefits to wildlife habitat should be the primary drivers. Prioritize treatments on state and	Great Gray Owl Grizzly Bear Hoary Bat Little Brown Myotis Silver-haired Bat Western Small-footed Myotis Lyrate Mountainsnail (*Oreohelix haydeni*) Thin-ribbed Mountainsnail (*Oreohelix tenuistriata*) Monarch (*Danaus plexippus*)

Objective	Strategy	Recommended Action(s)	Target SGCNs
		federal lands in areas that would benefit wildlife and their habitats during critical periods. (e.g., thinning to increase shrubs and other winter browse in big game wintering areas, etc.) When planning treatments on federal, state, and private lands, the treatment of noxious and invasive weeds should be integral to project planning, and appropriate actions both during and following project implementation should take place to prevent establishment of noxious/invasive weeds.	

High rated threats to Dry Lower Montane–Foothill Forest in the Overthrust Mountains

Noxious weeds and invasive annual grasses

Presence of noxious weeds such as cheatgrass, leafy spurge, dyers woad, yellow toadflax, musk thistle and others compete with native understory grasses and forbs as well as recruitment of young trees. Weeds are spread by livestock, wildlife, and vehicles.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Effectively control and restore areas dominated by noxious and invasive plants at a rate greater than the rate of the spread	Implement large-scale experimental activities to remove upland non-native invasive plants through various tools (DOI 2015)	Support the development of a framework for a national invasive species Early Detection and Rapid Response (EDRR) program (DOI 2105). Locate and coordinate installation of long-term studies and subsequent monitoring to test the efficacy of large-scale application of integrated pest management programs that include chemical, mechanical, biological, newly registered biocides, and subsequent restoration practices (DOI 2015). Explore the use of both herbicides and biological controls to control cheatgrass. Promote certified weed-free seeds/forage (Idaho Sage-grouse Advisory Committee 2006). Ensure that all equipment and field clothing brought to project areas are free from weed seed Carefully monitor and treat project areas for weed invasion for at least 3-5 years post project.	Great Gray Owl Grizzly Bear Hoary Bat Little Brown Myotis Silver-haired Bat Western Small-footed Myotis Lyrate Mountainsnail (*Oreohelix haydeni*) Thin-ribbed Mountainsnail (*Oreohelix tenuistriata*) Monarch (*Danaus plexippus*)

Objective	Strategy	Recommended Action(s)	Target SGCNs
		Do not plant aggressive invasive grasses and crops adjacent to aspen stands or include them in rehabilitation mixes	

Motorized use in dry lower montane–foothill forest

Outdoor recreation (hiking, camping, wildlife watching, photography, horse-back riding, motorized recreation) in the West is very popular, due primarily to large tracts of public land available for use. All-terrain vehicles, including motorcycles, ATVs, UTVs, and snowmobiles, are used by >27% of the population in the western U.S. (Cordell et al. 2005). Roads and trails, both managed and un-authorized, create management concerns and negative environmental impacts including creation of new pathways for the spread of invasive plants, soil erosion, displacement of wildlife sensitive to human and vehicle activity, habitat fragmentation, and sportsmen dissatisfaction.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Reduce road barriers to wildlife.	Coordinate development/location of key corridors.	Work with key agencies and stakeholders to ensure that roads and other linear infrastructure avoid sensitive habitat areas.	Great Gray Owl Grizzly Bear Hoary Bat Little Brown Myotis Silver-haired Bat Western Small-footed Myotis Lyrate Mountainsnail (*Oreohelix haydeni*) Thin-ribbed Mountainsnail (*Oreohelix tenuistriata*) Monarch (*Danaus plexippus*)
Minimize unrestricted cross-country travel (Otter 2012) in sensitive habitat—Priority (Core) and Important habitat areas for Sage-Grouse.	Develop and enact travel management plans and regulations to manage impacts to wildlife populations.	Limit OHV travel to existing roads, primitive roads, and trails in areas where travel management planning has not been completed or is in progress. Prioritize the completion of Comprehensive Transportation Management Travel Plans (CTMTPs) (Otter 2012). Locate areas and trails to minimize disturbance to Sage-Grouse and other species sensitive to OHV disturbance; use route upgrade, closure of existing routes, timing restrictions, seasonal closures, and creation of new routes to help protect habitat and reduce the potential for pioneering new unauthorized routes (BLM 2015). Conduct road upgrades and maintenance outside the Sage-Grouse breeding season to avoid disturbance on	Great Gray Owl Grizzly Bear Hoary Bat Little Brown Myotis Silver-haired Bat Western Small-footed Myotis Lyrate Mountainsnail (*Oreohelix haydeni*) Thin-ribbed Mountainsnail (*Oreohelix tenuistriata*) Monarch (*Danaus plexippus*)

Objective	Strategy	Recommended Action(s)	Target SGCNs
		leks (BLM 2015). Reward people for identifying and reporting illegal roads and trails or reporting users violating the travel plan.	

Species designation, planning and monitoring

Grizzly Bear

In recent years, Grizzly Bear have been observed in small numbers adjacent to the South Fork Snake River in areas of the Snake River Range and Caribou Range. This area is outside of the Primary Conservation Area (PCA) for Grizzly Bear, which is secure for Grizzly Bear, providing habitat conditions that ensure a recovered population is maintained and allow bears to continue to expand outside of the PCA (USFWS 2007). In this area of the Overthrust Mountains Section, successful management of Grizzly Bear will depend upon state and federal agencies that consider needs of Grizzly Bear while managing lands for other wildlife and natural resources (USFWS 2007). The challenge lies in managing increasing human-bear conflicts in new expansion areas such as the one described here.

Objective	Strategy	Recommended Action(s)	Target SGCNs
State and federal lands that support Grizzly Bear expansion	Consider habitat needs of Grizzly Bear when managing lands for other wildlife and natural resource uses (IYGBDAT 2002)	Monitor habitat conditions for Grizzly Bear outside the PCA Evaluate and mitigate potential impacts to Grizzly Bear and their habitat using the criteria and standards in the Grizzly Bear Conservation Strategy (USFWS 2007). Consider the need for secure habitat for Grizzly Bear when developing Travel Management Plans on state and federal lands	Grizzly Bear
	Proactively manage Human-Grizzly Bear conflicts (IYGBDAT 2002)	Conflict areas will be documented routinely and prioritized to focus proactive management actions to minimize conflicts Address existing and potential human activities that may cause future conflicts, including permitting new grazing allotments in Grizzly-occupied areas of the Overthrust Mountains Section	

Target: Subalpine–High Montane Conifer Forest

This habitat target includes the matrix forests of the subalpine zone. Sites are cold year-round, and precipitation is predominantly in the form of snow, which may persist until summer. Snowpacks are deep and late-lying in avalanche or drift zones, but thinner on wind-swept ridges. Summers are cool and dry. The tree canopy consists of Engelmann spruce and subalpine fir dominating either mixed or alone. Engelmann spruce can dominate sites (with minimal subalpine fir) in eastern Idaho where continental climate regime is most noticeable. Douglas-fir may persist in occurrences of this group for long periods without regeneration. Lodgepole pine is

common in many occurrences, and patches of nearly pure lodgepole pine are not uncommon (where wildfires have occurred), as well as mixed conifer/quaking aspen stands. Upper elevation

Caribou Mountain, Southeast Idaho © Becky Abel

examples may have more woodland physiognomy, and whitebark pine (*Pinus albicaulis*) exclusively in the northern portions of the section or limber pine throughout the section can be a seral component. Understory species may include mountain Saskatoon serviceberry (*Amelanchier alnifolia*), big sagebrush, rocky mountain juniper (*Juniperus scopulorum*), creeping barberry, Oregon boxleaf (*Paxistima myrsinites*), mallow ninebark, gooseberry currant (*Ribes montigenum*), russet buffaloberry, and grouse whortleberry (*Vaccinium scoparium*). Shrub cover is low under dense canopies or on xeric sites where grasses and forbs characteristic of subalpine grasslands or mountain big sagebrush shrublands are more common. Important herbs include western needlegrass (*Achnatherum occidentale*), pussytoes (*Antennaria* spp.), prickly sandwort, heartleaf arnica, broadleaf arnica (*Arnica latifolia*), timber milkvetch, pinegrass, elk sedge, Ross' sedge, buckwheat (*Eriogonum* spp.), aster (*Eurybia* spp.), sticky geranium (*Geranium viscosissimum*), silvery lupine (*Lupinus argenteus*), sidebells wintergreen (*Orthilia secunda*), sickletop lousewort (*Pedicularis racemosa*), low beardtongue (*Penstemon humilis*), poke knotweed (*Polygonum phytolacaefolium*), and hookedspur violet (*Viola adunca*). Disturbance includes occasional ice and wind dessication, blowdown, avalanches, and insect outbreaks. In the Overthrust Mountains Section, this habitat target, like the Dry Lower Montane–Foothill Forest target, tends toward more mature seral stages and would benefit from increased disturbance from fire and other treatments to create a mosaic of age classes.

Stewart Ridge, XXX range, Idaho © IDFG

The Overthrust Mountains Section is thought to be an important area for Wolverine (*Gulo gulo*) dispersal from Idaho into Utah and Colorado. The Overthrust Mountains includes Tier 1 and Tier 2 Priority Conservation Areas for Wolverine, as identified in the 2014 Management Plan for the Conservation of Wolverines in Idaho (IDFG 2014). Priority Conservation Areas were calculated based on potential wolverine use, cumulative threats, and amount of unprotected habitat. The Bear River Range was identified as being of the highest priority (Tier 1) for Wolverine conservation in the Overthrust Mountains. Among threats to Wolverine conservation, climate change, small populations and limited connectivity, dispersed snow sports recreation, human infrastructure, incidental trapping and shooting, and knowledge gaps have all been identified as affecting Wolverine in Idaho (IDFG 2014).

Target Viability

Viability of Subalpine–High Montane Conifer Forest in the Overthrust Section can be described as Fair. As described in the 2003 Revised Forest Plan for the Caribou National Forest, Engelmann

Caribou Mountain, Southeast Idaho © Caribou-Targhee National Forest

spruce/subalpine fir communities on the Forest have been assessed as being at high risk. Approximately 80% of acres are mature and old, with increasing stand densities and ladder fuels. The Engelmann spruce/subalpine fir is at risk primarily due to the dominance of mature and old age structure and changes in the historic non-lethal fire regimes. Some past timber harvest practices, livestock grazing practices and suppression of disturbances, particularly wildfire, have created landscapes that are prone to more intense disturbances than in the past due to the buildup of mature and older vegetation. Accepting that disturbances are inevitable, as well as critical to ecosystem function, means management actions need to focus on making watersheds resilient to these disturbances over the long-term while reducing recovery time. As these forests continue to age, the risk and potential severity of disturbances increase (CTNF 2003). In some areas, especially areas of exceptionally dense conifer, understories have been degraded or lost (as result of being shaded out by the over story), limiting the usefulness of these areas to wildlife.

Prioritized Threats and Strategies for Subalpine–High Montane Conifer Forest

High rated threats to Subalpine–High Montane Conifer Forest in the Overthrust Mountains

Lack of disturbance

Fire-dependent habitats such as Subalpine–High Montane Conifer Forest were probably subject to a moderate severity fire regime in pre-settlement times, with fire return intervals of 30-100 years. Fire is important for maintaining a range of seral stages characteristic of subalpine forests. The natural fire disturbance regime is of relatively infrequent, mixed– to high–severity fire that results in a patchwork of forests with varying stand structure and composition. In the Overthrust Mountains Section, fire in this habitat has recently been infrequent. Emphasis on protecting property and a lack of understanding of the benefits of fire among the public has led to fire suppression. Fire suppression contributes to insect outbreaks, widespread decline in habitat quality, and increased risk of large–scale, severe fires. This habitat tends toward mature seral stages and stands that are homogenous rather than have a mosaic of age classes.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Manage forests for a diversity of structure and composition. Maintain or restore productive and diverse populations of plants. Maintain conifer types and early successional stages and restore disturbance processes through vegetation management, and fire.	Use methods of vegetation treatment that emulate natural disturbance and successional processes. Restore natural disturbance regimes (e.g., beaver activity)	To the extent possible, Allow naturally caused (lightning) fires to play their role in the ecosystem by allowing them to burn (i.e., Managing wildfire for resource benefit; CTNF Management Plan 2003 p. 3-4) Implement a variety of vegetation management projects on federal, state, and privately managed lands (these could include prescribed fire and mechanical treatments such as thinning, timber harvest, etc.) across the Section to return areas to early seral conditions. While a variety of benefits can be realized from these projects, restoration of proper ecological functions and benefits to wildlife habitat should be the primary drivers. When planning treatments on federal, state, and private lands, the treatment of noxious and invasive weeds should be integral to project planning, and appropriate actions both during and following project implementation should take place to prevent establishment of noxious/invasive weeds. Re-introduce beaver where appropriate	Wolverine Grizzly Bear Hoary Bat Silver-haired Bat

Species designation, planning and monitoring

Great Gray Owl

Great gray owls are considered a contrast species, which means they require the juxtaposition of early- and late-seral stages for foraging and for nesting and roosting and this juxtaposition must be considered when managing the spatial arrangement of habitats in order to meet all aspects of life functions for great gray owl. Specifically, large contiguous areas with small forest openings would benefit great gray owl as well as other SGCNs (Silver-haired Bat and Hoary Bat). Snags are a special habitat feature for great gray owls. They do not build their own nests but rely on existing platforms such as stick nests originally created by other birds or formed by dwarf mistletoe brooms, depressions in broken-topped dead trees, stumps, or artificial platforms (Wisdom et al. 2000).

Objective	Strategy	Action(s)	Target SGCNs
Maintain or increase foraging and nesting habitat for Great Gray Owls	Restore meadow habitat adjacent to nesting habitat where conifer encroachment is reducing meadow size Increase nest site availability (e.g. open forest habitat)	Work with land managers to identify and fund restoration actions Install nest platforms where appropriate	Great Gray Owl
Minimize nest site disturbance for Great Gray Owl	Educate wildlife watchers and photographers about sensitivity of nesting owls	Write articles about disturbance during wildlife viewing for Windows for Wildlife Present information to Audubon Society chapters Create an informational brochure to disseminate to photographers and wildlife watchers	Great Gray Owl

Target: Sagebrush Steppe

Over 30% of the Overthrust Mountains Ecosection is comprised of Sagebrush Steppe that consists of communities of Wyoming and Basin big sagebrush (*Artemisia tridentata* ssp. *wyomingensis* and *A. tridentata* ssp. *tridentata*) at lower elevations and Mountain big sagebrush (*A. tridentata* ssp. *vaseyana*) at higher elevations along with perennial grasses and forbs. Livestock grazing is an important land-use activity within this area. Although resource management programs affecting wildlife habitat within sagebrush steppe are currently dominated by considerations for Sage-Grouse populations, many other species are reliant on sagebrush steppe habitat. One area of the Overthrust Mountains, the Sheep Creek Hills, supports a small population of Pygmy Rabbit.

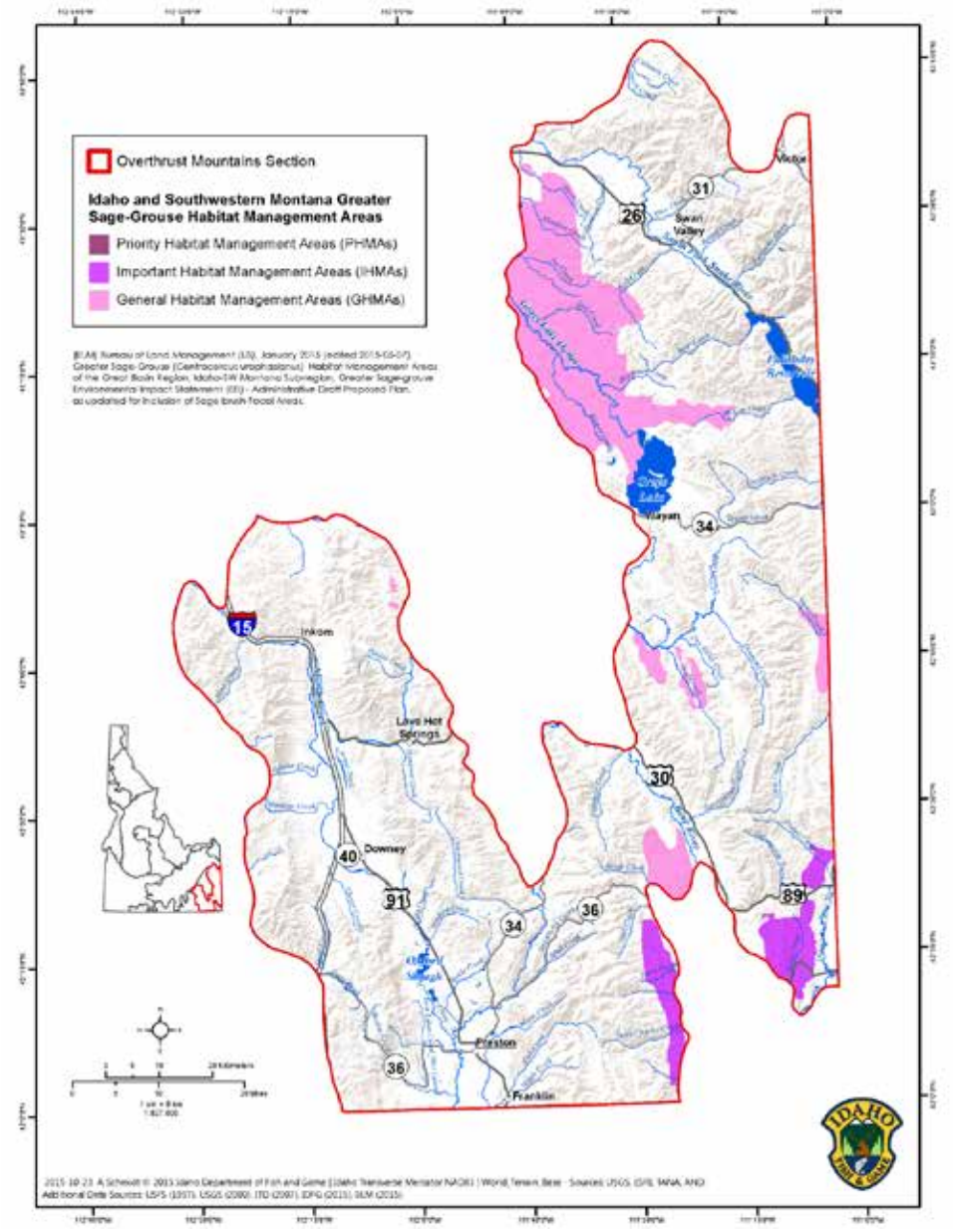

Fig. 9.3 Map of Idaho and Southwestern Montana Greater Sage-Grouse Habitat Management Areas in the Overthrust Mountains

Target Viability

Viability of sagebrush steppe habitat in the Overthrust Section can be described as Fair. Habitat varies from generally intact and in good ecological condition to highly degraded. Sagebrush steppe in the Sheep Creek Hills north of Bear Lake Plateau remains relatively intact and supports

Paris Peak, Bear River Range, Southeast Idaho © Caribou–Targhee National Forest

healthy populations of Greater Sage-Grouse (Sage-Grouse) and a small population of pygmy rabbit. Sagebrush steppe on the east side of the Bear River Range including the Paris Hills is fragmented from residential development as well as mining activities but continues to support populations of Sage-Grouse and is an Important (IHMA) Greater Sage-Grouse Habitat Management Area (Fig. 9.3). The middle Portneuf Valley has been converted largely to agricultural lands and habitat that remains is fragmented and grazed heavily. On the Caribou-Targhee National Forest, 40% of the sagebrush acres have a canopy cover greater than 15% with an increase in bare ground and soil loss. With the dense overstory, the understory vegetation is diminishing. Sagebrush steppe across the Overthrust Mountains has been impacted by extensive conifer encroachment (CTNF 2003).

Prioritized Threats and Strategies for Sagebrush Steppe

High rated threats to Sagebrush Steppe in the Overthrust Mountains

Livestock grazing management that is inconsistent with sagebrush steppe management objectives

In the context of this plan, "improper" is defined as grazing beyond the capacity of the resource in either direction (e.g., overuse such as along riparian areas that need protection; i.e., there needs to be seasonal adjustments). Negative impacts of grazing are typically associated with persistent heavy grazing. In the Governor's Alternative (Otter 2012), improper livestock grazing management is considered a secondary threat with monitoring and management actions tailored accordingly.

Livestock grazing can affect wildlife habitat in many ways (Krausman et al. 2009). For example, improper livestock grazing management can change habitat features that directly influence birds by reducing plant species diversity and biomass (Reynolds and Trost 1981, Bock and Webb 1984, Saab et al. 1995). Additionally, changes in water and nutrient cycling caused by improper grazing management can promote the spread of invasive species, which then degrade native

bird habitats by altering fire and disturbance regimes (Rotenberry 1998). Sagebrush systems are particularly sensitive to grazing disturbance (Mack and Thompson 1982).

In the Overthrust Mountains, factors that contribute to this problem include insufficient funds for federal and state land management agency oversight, and insufficient monitoring (i.e., lack of appropriate rangeland health assessment monitoring data gathered annually on a consistent basis to support trend analysis). Consequently, some management decisions are compromised by a lack of appropriate data. On private lands, contributing factors include overuse, overgrazing, lack of protections on sensitive areas (riparian areas, aspen stands) and in some cases eradication of the sagebrush component (to improve forage).

Objective	Strategy	Recommended Action(s)	Target SGCNs
Manage livestock to maintain rangeland health and habitat quality (Otter 2012).	Manage the timing, intensity, duration, and frequency of grazing practices to manipulate vegetative condition (Otter 2012).	Prioritize permit renewals and land health assessments for allotments with declining Sage-Grouse populations (Otter 2012). Inform affected permittees and landowners regarding Sage-Grouse habitat needs and conservation measures (Idaho Sage-grouse Advisory Committee 2006). Incorporate GRSG Seasonal Habitat Objectives (Table 2-2 in BLM 2015) into relevant resource management plans and projects. Use the Sage-Grouse Habitat Assessment Framework (Stiver et al. 2015) with an appropriate sampling design to conduct fine-scale habitat assessments to inform grazing management. Undertake adaptive management changes related to existing grazing permits when improper grazing is determined to be the causal factor in not meeting habitat objectives (Otter 2012).	Greater Sage-Grouse Golden Eagle Long-billed Curlew Sage Thrasher Sharp-tailed Grouse Pygmy Rabbit Wyoming Ground Squirrel A Tiger Beetle (*Cicindela decemnotata montevolans*) Common nighthawk Western Small-footed Myotis Townsend's Big-eared Bat Little Brown Myotis Monarch
	Maintain MOU between ISDA and BLM as it pertains to grazing management.	Involve permittees in providing monitoring information, the interpretation of monitoring data, & providing input into grazing management adjustments to meet the goals and objectives of federal land management agencies and the permittees (Sanders 2006).	
Assess the impacts (both negative and, potentially, positive) of livestock grazing on sagebrush-steppe obligate passerines (Rotenberry 1998).	Implement new, properly designed and replicated experiments involving a variety of alternative grazing treatments	Conduct experiments over multiple years (Rotenberry 1998).	

Objective	Strategy	Recommended Action(s)	Target SGCNs
	(including no grazing at all) across the spectrum of major shrub-steppe habitat types (Rotenberry 1998).		
Maintain or enhance wildlife values on working ranches.	Develop partnerships that help keep sustainable grazing the prevailing land use (Krausman et al. 2009).		
Support the continued responsible use of federal lands for grazing to maintain open spaces and important habitat conditions (e.g., year-round water sources) that benefit wildlife (WGA Policy Resolution 2015-03).	Implement Western Governors' Association (WGA) policy for public lands grazing (for details, see WGA Policy Resolution 2015-03).	Use sound, science-based management decisions for federal and state managed lands and base these decisions upon flexible policies that take into account local ecological conditions and state planning decisions.	

Motorized use in sagebrush steppe

Outdoor recreation (hiking, camping, wildlife watching, photography, horse-back riding, motorized recreation) in the West is very popular, due primarily to large tracts of public land available for use. All-terrain vehicles, including motorcycles, ATVs, UTVs, and snowmobiles, are used by >27% of the population in the western U.S. (Cordell et al. 2005). Habitat degradation, displacement, and wildlife harassment are some environmental impacts caused by motorized vehicle use (Ouren et al. 2007). Infrastructure such as roads and highways is a primary threat to Sage-Grouse and other sagebrush-steppe species by causing the fragmentation and direct loss of shrub-steppe habitats (Otter 2012; Fed Regist. 79[234]:72464–72465). Additionally, recreation in the form of Off Highway Vehicle (OHV) use is considered a secondary threat to Sage-Grouse in the Governor's Alternative (Otter 2012).

Objective	Strategy	Recommended Action(s)	Target SGCNs
Reduce road barriers to wildlife.	Coordinate development/location of key corridors.	Work with key agencies and stakeholders to ensure that roads and other linear infrastructure avoid sensitive habitat areas.	Golden Eagle Long-billed Curlew Sage Thrasher Sharp-tailed Grouse Pygmy Rabbit Wyoming Ground Squirrel A Tiger Beetle (*Cicindela decemnotata montevolans*) Common nighthawk Western Small-footed
Minimize unrestricted cross-country travel (Otter 2012) in sensitive habitat—Priority (Core) and Important habitat areas	Develop and enact travel management plans and regulations to manage impacts to wildlife populations.	Limit OHV travel to existing roads, primitive roads, and trails in areas where travel management planning has not been completed or is in progress. Prioritize the completion of Comprehensive Transportation Management Travel Plans (CTMTPs)	

Objective	Strategy	Recommended Action(s)	Target SGCNs
for Sage-Grouse.		(Otter 2012). Locate areas and trails to minimize disturbance to Sage-Grouse and other species sensitive to OHV disturbance; use route upgrade, closure of existing routes, timing restrictions, seasonal closures, and creation of new routes to help protect habitat and reduce the potential for pioneering new unauthorized routes (BLM 2015). Conduct road upgrades and maintenance outside the Sage-Grouse breeding season to avoid disturbance on leks (BLM 2015). Implement seasonal trail closures, buffer zones around Golden Eagle nests, and suitable location of staging areas to minimize OHV effects (Steenhof et al. 2014).	Myotis Townsend's Big-eared Bat Little Brown Myotis Monarch

Unknown status or causes of decline

Multiple species identified as SGCN are declining as a result of unknown causes. The priority for many of these species in the coming years is to identify what is/are the root cause(s) of their apparent decline, and develop a strategy for addressing it.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Determine cause(s) of decline for nightjar species in Idaho.	Work with Western Working Group Partners in Flight (WWG PIF) and the Pacific Flyway Nongame Technical Committee (NTC) to assess causes(s) of decline.	Assist WWG PIF with adjusting current Nightjar Survey Network protocols to collect data that will inform potential cause(s) of decline, including assessments of insect prey populations and their habitats. Work with WWG PIF and NTC to identify opportunities for research on contaminant impacts.	Common Nighthawk

Species designation, planning and monitoring

Objective	Strategy	Action(s)	Target SGCNs
Determine benefits of Sharp-tailed and Greater Sage-Grouse management activities on nontarget species	Develop songbird monitoring strategy on sharp-tail and Sage-Grouse management areas	Work with NGOs, such as Intermountain Bird Observatory and Klamath Bird Observatory, and agency partners to develop protocol/sampling	Sage Thrasher

Target: Riverine–Riparian Forest and Shrubland

Riverine wetlands occur in river and stream channels. They include floodplains and riparian vegetation influenced by stream channel hydrology. Riparian habitat is included in this definition of riverine wetlands and is described below. The dominant water sources are overbank flooding from the channel and subsurface shallow water table connections between the stream channel and wetlands (Brinson et al. 1995). Other water sources are overland runoff from adjacent uplands, tributaries, and precipitation. Flow may be perennial, perennial but interrupted, or ephemeral/intermittent. Surface flows are complex seasonally and in multiple directions. Water also moves laterally in the shallow groundwater table between the channel and riparian zones, as well as out of the system through infiltration into deep groundwater.

In the Overthrust Mountains Ecological Section, the riverine ecosystem includes a variety of important aquatic habitat types including: habitat within the channels of headwaters and relatively small 1st- to 3rd-order streams including numerous montane streams in the Snake River, Caribou, Webster, Aspen, Portneuf, Bannock, and Bear River Ranges. This target also includes 4th+ order Streams and Rivers including habitat within the channels of larger streams and rivers. The Overthrust Mountains Section supports rivers such as the South Fork of the Snake River, Bear River, and Portneuf River.

Low-elevation riparian forests and woodlands are found along permanent, intermittent, and ephemeral streams, or on river floodplains. Persistence is dependent on annual to episodic flooding which creates alluvial features suitable for tree reproduction and sufficient groundwater. In the Overthrust Mountains, this habitat is primarily represented along the South Fork of the Snake River. The South Fork Snake River supports the largest cottonwood riparian forest left in the western United States. This forest shelters one of the most diverse breeding landbird communities in the Greater Yellowstone Ecosystem including the rare western Yellow-billed cuckoo (*Coccyzus americanus*). The South Fork provides secure winter habitat for thousands of waterfowl including hundreds of trumpeter swans. There is some evidence that the South Fork cottonwood forest provides important stopover habitat for migrating landbirds. Its' importance as stopover habitat may be accentuated by regional aspen declines (IDFG 2010).

Three common plant community types on established flood plains along the South Fork include narrowleaf cottonwood (*Populus angustifolia*) with red osier dogwood (*Cornus sericea*), narrowleaf cottonwood with silverberry (*Elaeagnus commutata*), and narrowleaf cottonwood with goldenaster (*Heterotheca villosa*). Wetter, more recently disturbed riparian sites are frequently represented by the presence of narrowleaf cottonwood seedlings and saplings, reed canarygrass (*Phalaris arundinacea*), water birch (*Betula occidentalis*), sandbar willow (*Salix exigua*) and yellow willow (*S. eriocephala*). On drier sites, particularly outside of the levy along the lower South Fork Snake, Rocky Mountain juniper (*Juniperus scopulorum*), Canada goldenrod (*Solidago canadensis*), skunkbush sumac (*Rhus tilobata*) and licorice root (*Glycyrrhiza lepidota*) are common understory components (Merigliano 1996). These forests and woodlands require flooding and some gravels for seedling establishment. Sites are subject to temporary flooding during spring runoff. Underlying gravels may keep the water table just below the ground surface and are favored substrates for cottonwood. Large bottomlands may have large occurrences, but most have been cut over or cleared for agriculture.

Target Viability

Fair. Within the Overthrust Mountains, the South Fork Snake River is impounded by a major dam that significantly changes the hydrograph (Palisades). Numerous smaller dams, largely for irrigation diversion or hydropower generation, also form impediments to water flow and animal movements elsewhere in the Overthrust Mountains. Riparian habitats associated with riverine systems, particularly cottonwood forests, are at risk and require conservation action. Dams control flooding and long-term viability is questionable because flood control projects have changed the hydrograph. Riparian areas seldom receive flows high enough to cause the scouring needed to expose bare mineral soil for cottonwood regeneration. Constrained flows also reduce the ability of the rivers to carry sediments to downstream habitats.

Western Yellow-billed Cuckoo

The rule to list the western Yellow-billed Cuckoo as threatened was published in the Federal Register in 2014. The western distinct population segment of the Yellow-billed Cuckoo includes Idaho, and the South Fork Snake River has been identified in the proposed critical habitat for cuckoos in the state. Breeding western Yellow-billed Cuckoos are riparian obligates and nest almost exclusively in low to moderate elevation riparian woodlands with native broadleaf trees and shrubs that are 20 hectares (ha) or more in extent within arid to semiarid landscapes. At the landscape level, the amount of cottonwood–willow-dominated vegetation cover and the width of riparian habitat influence western Yellow-billed Cuckoo breeding distribution. Riparian patches used by breeding cuckoos vary in size and shape, ranging from a relatively contiguous stand of mixed native/exotic vegetation to an irregularly shaped mosaic of dense vegetation with open areas (Halterman et al. 2015). Cuckoos eat a wide variety of prey items. These are primarily large arthropods such as grasshoppers, and caterpillars, but may also include frogs, spiders, tent caterpillars, and a variety of other insects. There is evidence to suggest that population levels and breeding may be closely tied to abundance of certain food items (Halterman et al. 2015).

The decline of the western Yellow-billed Cuckoo is primarily the result of riparian habitat loss and degradation. Principal causes of riparian habitat destruction, modification, and degradation in the range have occurred from alteration of hydrology due to dams, water diversions, management of river flow that differs from natural hydrological patterns, channelization, and levees and other forms of bank stabilization that encroach into the floodplain. These losses are further exacerbated by conversion of floodplains for agricultural uses, such as crops and livestock grazing. In combination with altered hydrology, these threats promote the conversion of existing primarily native habitats to monotypic stands of non-native vegetation, reducing the suitability of riparian habitats for the cuckoo (Halterman et al. 2015).

Prioritized Threats and Strategies for Riverine–Riparian Forest and Shrubland

Very High rated threats to Riverine–Riparian Forest and Shrubland in the Overthrust Mountains

Changes in precipitation and broad-scale hydrologic regimes

During the 21st century, most projections indicate the Pacific Northwest will become progressively warmer and wetter, although summer drought may worsen. Current projections indicate temperatures in the region will increase 0.1°C - 0.6°C per decade through at least 2050, and although warming is expected across all seasons, the largest temperature increases will occur in summer (Kunkel et al. 2013). Given projected temperature increases, much of the western U.S. is expected to transition from a snow-dominated system to one more rain-dominated, spring snowpack is expected to decline, especially at warmer low to mid-elevations, and existing snow is expected to continue melting earlier (Pierce and Cayan 2013), changing hydrological regimes within this habitat. Less snowpack equates to more drought stress to native plants, and increases conditions for drought adapted invasive species to establish.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Improve landscape resilience.	Manage for diverse, healthy plant communities able to resist stresses including drought and drought mediated impacts such as invasion by non-native plants and wildfire. Increase capacity for water storage to combat the effects of climate change.	Research options for managing this habitat under forecasted climate models. Work with other agencies, organizations and user groups across the Overthrust Mountains to address climate change impacts across landscapes, and refine land management planning options and alternatives down to local level, implementable projects where possible. Engage in microclimate monitoring to better identify and understand local pockets of environmental opportunity to enhance habitat resistance to climate induced stressors. Engage in researching to identifying plants useful for habitat restoration or enhancement from current climate regimes that are forecast to be local future climate regimes. Support efforts to increase public and political awareness of climate change impacts to local landscapes and wildlife dependent on them. Research options for managing livestock grazing in this habitat under forecasted climate models (i.e.-	Yellow-billed Cuckoo Northern Leopard Frog Harlequin Duck Rocky Mountain Duskysnail Hoary Bat Silver-haired Bat Little Brown Myotis Western Small-footed Myotis Sandhill Crane Trumpeter Swan Pondsnail Species Group Bear Lake Springsnail

Objective	Strategy	Recommended Action(s)	Target SGCNs
		drought conditions). Work with agencies, organizations and livestock operators to use this information to both be pro-active and refine land management planning options and alternatives down to local level implementable projects. Implement livestock drought management alternatives on IDFG owned lands.	

High rated threats to Riverine–Riparian Forest and Shrubland in the Overthrust Mountains

Dams and water diversions

Water diversion affects peak flows, resulting in narrowing of riparian corridor that provides critical habitat for Yellow-billed Cuckoos. These habitats need periodic flooding to maintain suitable, multi-layered riparian habitat. Controlled river flows and the resulting near monoculture of mature/decadent cottonwood in some river systems has likely resulted in a major loss of suitable breeding habitat for this species, and will likely continue as water demands continue to climb.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Improve recharge to the rivers and associated wetlands	Support Aquifer Recharge	Actively participate in efforts to increase appropriate aquifer recharge efforts that will benefit fish and wildlife resources.	Yellow-billed Cuckoo Northern Leopard Frog Harlequin Duck Rocky Mountain Duskysnail Hoary Bat Silver-haired Bat Little Brown Myotis Western Small-footed Myotis Sandhill Crane Trumpeter Swan Pondsnail Species Group Bear Lake Springsnail
Improve compliance with water use	IDWR and water masters evaluate adjudication and enforce violations	<Insert action(s)>	
Improve hydrograph to better mimic natural variation	Work with Bureau of Reclamation to find ways to reshape flows and restore periodic flooding to key riparian habitats	Maintain appropriate winter flows to minimize impacts to aquatic species Build in periods of high flows annually to mimic spring runoff. Seek opportunities to create flows that can periodically mimic a 25 year event. Avoid siting new diversions, dams, and hydropower developments on streams and rivers with important wildlife habitat.	
	Maintain and protect water quality	Introduce buffer zones along montane riparian habitats to maintain riparian structure and function. Avoid activities in the adjacent uplands that alter runoff and water quality such as clear-cut logging, road	Harlequin Duck Northern Leopard Frog Rocky Mountain Duskysnail Trumpeter Swan Pondsnail Species Group Bear Lake Springsnail

Objective	Strategy	Recommended Action(s)	Target SGCNs
		construction, and mining. Study and monitor potential transportation hazards associated with road and rail shipment of chemical products adjacent to breeding streams. Develop preparation and response plans to any transportation incident involving hazardous materials. Avoid locating mining structures, support facilities, and roads within riparian areas. For approved activities, require a reclamation plan, reclamation bonds, and monitoring to assure chemical, physical, hydrological, and biological stream stability.	
Reduce the trend in cottonwood forest loss	Work with landowners to protect remaining cottonwood forest	Support efforts to use LWCF funds to acquire an interest in cottonwood forest areas. Educate landowners/managers about the values of cottonwood forests Work with landowners to restore cottonwood forests when possible.	Yellow-billed Cuckoo Hoary Bat Silver-haired Bat Little Brown Myotis Western Small-footed Myotis

Livestock grazing management that is inconsistent with riparian forest and shrubland management objectives

Livestock grazing can affect wildlife habitat in many ways (Krausman et al. 2009). For example, livestock grazing can change habitat features that directly influence birds by reducing plant species diversity and biomass (Reynolds and Trost 1981, Bock and Webb 1984, Saab et al. 1995). In the Riverine–Riparian Forest and Shrubland in the Overthrust Mountains Section, livestock grazing can impact breeding western Yellow-billed Cuckoos that nest along the South Fork Snake River by changing the structure of the understory and introducing invasive plant species.

In the Overthrust Mountains, factors that contribute to this problem include insufficient funds for federal land management agency oversight, and insufficient monitoring (i.e., lack of appropriate rangeland health assessment monitoring data gathered annually on a consistent basis to support trend analysis). Consequently, some management decisions are compromised by a lack of appropriate data.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Protect streamside riparian vegetation	Control Livestock grazing in sensitive wetland and riparian areas.	Introduce buffer zones along montane riparian habitats to maintain quality structure and function, including snags and woody debris. Manage grazing (length and timing of season, stock levels, location, development of water sources) to	Yellow-billed Cuckoo Northern Leopard Frog Harlequin Duck Rocky Mountain Duskysnail Hoary Bat Silver-haired Bat Little Brown Myotis Western Small-footed

Objective	Strategy	Recommended Action(s)	Target SGCNs
		maintain stream bank stability and riparian vegetation (especially shrubs). Create exclusion fencing along aquatic areas. Encourage salting at least ¼ mile away from riparian/wetland areas where possible. Encourage managers to restrict riparian use during the autumn months when livestock are more likely to browse on shrubs.	Myotis Sandhill Crane Trumpeter Swan Pondsnail Species Group Bear Lake Springsnail

Unknown status or causes of decline

Multiple species identified as SGCN are declining as a result of unknown causes. The priority for many of these species in the coming years is to identify what is/are the root cause(s) of their apparent decline, and develop a strategy for addressing it.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Determine causes of decline in Yellow-billed Cuckoos	Participate in coordinated monitoring Develop research projects focused on potential causes of decline	Work with Arizona Department of Game and Fish and Western Working Group of Partners in Flight (WWG) on Competitive State Wildlife Grant Proposal for a west-wide cuckoo survey Collaborate with WWG and other partners on projects that address declines of this species.	Yellow-billed Cuckoo
Reduce potential impacts of neonicotinoids on insectivorous birds	Reduce use of neonicotinoids on the landscape Encourage adherence to the principles of Integrated Pest Management and encourage use of environmentally benign pesticides at small scales	Ban use of neonicotinoids as seed coatings Prohibit use of neonicotinoids on state lands, particularly Wildlife Management Areas. Work with NRCS to prohibit use of neonicotinoids on conservation easement/Farm Bill properties Suspend use of neonicotinoids to allow scientific review of impacts Work with American Bird Conservancy to develop agricultural industry-targeted outreach materials to inform of impacts to both wildlife and crop health.	Yellow-billed Cuckoo Common Nighthawk
Determine level of impacts of neonicotinoids on insectivorous birds	Conduct research on impact levels on watershed scale Update EPA thresholds for incident reporting, which are currently set too low.	Provide relevant bird and bat data to American Bird Conservancy for on-going research project Develop neonicotinoid-free communities and watersheds to provide means for comparing with communities and watersheds that are exposed to neonicotinoids Work with American Bird Conservancy and other NGOs on project design and implementation	Yellow-billed Cuckoo Common Nighthawk

Objective	Strategy	Recommended Action(s)	Target SGCNs
		Provide support for American Bird Conservancy's efforts to update EPA thresholds	

Target: Depressional & Groundwater-Dependent Wetland Complexes

In the Overthrust Mountains Ecological Section, both depressional and groundwater dependent wetlands occur. However, in the context of this plan for the Overthrust Mountains Section, this target refers largely to Grays Lake National Wildlife Refuge and Oxford Slough Waterfowl Production Area, and both can be described as Depressional – Groundwater Dependent Wetland Complexes.

Gray's Lake NWR, Southeast Idaho © IDFG

Depressional wetlands occur in topographic depressions. Elevation contours are closed, thus allowing the accumulation of surface water. Dominant water sources are a combination of precipitation, ground water discharge, lateral sub-surface flow, seasonally high water tables, overland flow from adjacent uplands, or other sources. The direction of flow is normally from the surrounding uplands toward the center of the depression. Depressional wetlands may have any combination of inlets and outlets or lack them completely. Dominant hydrodynamics are seasonal vertical fluctuations. Depressional wetlands lose water through intermittent or perennial drainage from an outlet, by evapotranspiration, or infiltration to ground water. Vernal pools, playas, old oxbows or meanders that are disconnected from river floodplains, and many constructed wetlands are common examples of depressional wetlands. Depressional wetlands supporting emergent marshes or swamp forests may accumulate significant amounts of organic matter. In the context of the Overthrust Mountains Section, flood-irrigated habitats (FIH) are included as depressional wetlands because of the

Shorty's Overlook at Gray's Lake, Southeast Idaho © USFWS

shallow, flooded foraging habitat they provide for White-faced Ibis (*Plegadis chihi*).

Many flood-irrigated habitats occur in historic wet meadow and wetland footprints of intermountain valleys and basins. These FIHs, particularly perennial pasture and haylands in the historic floodplain, serve as surrogate wetlands that largely mimic the historic ecological function of natural flooding in the floodplain. These surrogate wetland functions are particularly manifested when diverted surface water for flood-irrigation originates from snow-pack driven rivers and streams. While the timing and duration of surface flooding on FIHs varies widely, many reflect annual environmental variation in snow-pack and streamflow conditions. The spread of surface-water across FIH mimics natural hydrologic processes and contributes to important ecological functions including soil hydration, aquifer recharge, water recycling/circulation, and ameliorating stream temperatures through soil saturation and discharge, and increasing persistence of hydric habitats during the growing season (C. Colson, pers. comm.).

Clark's Cut water control structure at Gray's Lake, Southeast Idaho © USFWS

This target also contains a subset of groundwater-dependent ecosystems (GDEs), specifically springs and groundwater-dependent sloped wetlands. Springs are GDEs where groundwater discharges at the ground surface, often through complex subsurface flow paths (Stevens and Meretsky 2008), including both cold and hot (geothermal) springs. Spring-dependent communities of plants and animals often exist where springs emerge. A variety of other wetland types are also dependent on groundwater fed sub-surface flows and seasonal seeps. For our purposes, GDE wetlands include fens; marshes, shrublands, and woodland swamps in sloped settings; wet and mesic meadows; and alkaline-saline wetlands. Groundwater-dependent wetlands often occur on sloping land with gradients ranging from steep hillsides to nearly imperceptible. Slope wetlands differ from depressional wetlands by the lack of closed contours. Groundwater sources can be either a regional aquifer or from localized infiltration of surface water (e.g., precipitation, seasonal flooding). Water flow is downslope and unidirectional. Groundwater-dependent wetlands lose water primarily by subsurface outflow, surface flows, and evapotranspiration. Groundwater-dependent wetlands may develop channels, but the channels serve only to convey water away from the groundwater-dependent wetland.

Target Viability

Viability of Depressional – Groundwater Dependent Wetland Complexes in the Overthrust Section can be described as Fair. Early human settlement patterns in the Intermountain West were closely associated with water and wetland resources. Wide-scale and systematic development of water resources for agricultural, energy, industrial, and domestic uses has had tremendous impacts on wetland systems. These and other anthropogenic modifications reduced abundance of wetlands in western states 30–91% between the 1780s and mid-1980s,

with an estimated loss of 57% of historic wetlands in the Intermountain West (Dahl 1990, Ratti and Kadlec 1992). Semi-permanent and permanent wetlands, Grays Lake and Oxford Slough, are managed as National Wildlife Refuges and are relatively protected, but seasonal and temporary wet-meadow wetlands and semi-permanent wetlands that occur on private lands have been historically altered by grazing or draining. Wetland habitats at Grays Lake NWR are highly altered from modified drainage and altered hydrologic regimes resulting in habitat degradation. Wildlife productivity has been substantially reduced from the 1940-50s. Annual drawdown of Grays Lake has impacted Sandhill Crane nest success and recruitment. Breeding pairs of Trumpeter Swans are not producing at replacement levels and lack suitable water to fledge cygnets in most years (W. Smith, pers. comm.).

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Caribou Mountain, Southeast Idaho © Caribou-Targhee National Forest

Conversion and degradation of natural wetlands impacts a variety of wetland-dependent species, including several SGCNs, such as White-faced Ibis and American Bittern (*Botaurus lentiginosus*). There are six colonies of White-faced Ibis in Idaho. This species requires deep wetland bulrush marshes for breeding and shallowly flooded habitat for foraging, which includes both natural wetlands and flood-irrigated agricultural fields. Loss of natural wetlands within 20 km of White-faced Ibis breeding colonies threatens the viability of Ibis. American Bittern require large, intact bulrush and cattail marshes for breeding (Lowther et al. 2009). Marshes that have become decadent are not typically suitable for this species, and numbers of bitterns using a marsh that has transitioned to a decadent condition dwindle quickly. In Idaho, this habitat is limited mostly to National Wildlife Refuges and IDFG Wildlife Management Areas. Additionally, groundwater extraction resulting in loss of marsh habitat is the greatest threat to Black Terns in Idaho (Heath et al. 2009).

Prioritized Threats and Strategies for Depressional – Groundwater Dependent Wetland Complexes

Very High rated threats to Depressional – Groundwater Dependent Wetland Complexes in the Overthrust Mountains

Changes in precipitation and broad-scale hydrological regimes

During the 21st century, most projections indicate the Pacific Northwest will become progressively warmer and wetter, although summer drought may worsen. Current projections

indicate temperatures in the region will increase 0.1°C - 0.6°C per decade through at least 2050, and although warming is expected across all seasons, the largest temperature increases will occur in summer (Kunkel et al. 2013). Given projected temperature increases, much of the western U.S. is expected to transition from a snow-dominated system to one more rain-dominated, spring snowpack is expected to decline, especially at warmer low to mid-elevations, and existing snow is expected to continue melting earlier (Pierce and Cayan 2013), changing hydrological regimes within this habitat. Less snowpack equates to more drought stress to native plants, and increases conditions for drought adapted invasive species to establish.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Assess potential impacts of drought on wetland-dependent birds	Conduct wetland connectivity assessment in the West	Work with Pacific Flyway Nongame Technical Committee to develop and implement a connectivity assessment Consider a landscape conservation design approach to prioritize and identity appropriate actions.	American Bittern Black Tern Long-billed Curlew Trumpeter Swan White-faced Ibis Franklin's Gull Sandhill Crane
Improve landscape resilience.	Manage for diverse, healthy plant communities able to resist stresses including drought and drought mediated impacts such as invasion by non-native plants and wildfire. Increase capacity for water storage to combat the effects of climate change.	Research options for managing this habitat under forecasted climate models. Work with other agencies, organizations and user groups across the Overthrust Mountains to address climate change impacts across landscapes, and refine land management planning options and alternatives down to local level implementable projects where possible. Engage in microclimate monitoring to better identify and understand local pockets of environmental opportunity to enhance habitat resistance to climate induced stressors. Engage in researching to identifying plants useful for habitat restoration or enhancement from current climate regimes that are forecast to be local future climate regimes. Support efforts to increase public and political awareness of climate change impacts to local landscapes and wildlife dependent on them. Research options for managing livestock grazing in this habitat under forecasted climate models (i.e.-drought conditions). Work with agencies, organizations and livestock operators to use this information to both be pro-active and refine land management planning options and alternatives down to local level implementable projects. Implement livestock drought management	Northern Leopard Frog Western Toad American Bittern Black Tern Long-billed Curlew Trumpeter Swan White-faced Ibis Franklin's Gull Sandhill Crane

Objective	Strategy	Recommended Action(s)	Target SGCNs
		alternatives on IDFG owned lands.	

High rated threats to Depressional – Groundwater Dependent Wetland Complexes in the Overthrust Mountains

Livestock grazing management that is inconsistent with depressional – groundwater dependent wetland management and restoration objectives

Habitat management at Grays Lake focuses on measures to benefit cranes and waterfowl. Vegetation is manipulated by hay cutting, cattle grazing, and controlled burns, creating feeding and nesting sites for a variety of bird species. Additionally, diversion from springs for livestock water affects adjacent habitats.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Livestock grazing management that is consistent with depressional and groundwater-dependent wetland management and restoration objectives	Limit timing of grazing activities to avoid habitat degradation and trampling nests	Time grazing activities to avoid critical nesting periods Enforce timing restriction	Northern Leopard Frog Western Toad American Bittern Black Tern Long-billed Curlew Trumpeter Swan White-faced Ibis Franklin's Gull Sandhill Crane
	Limit intensity of grazing activities to avoid habitat degradation	Wetland habitats should be lightly to moderately grazed at most and carefully monitored for appropriate use. Exclude livestock from areas that are degraded. Exclude livestock use from areas where improvement projects have occurred until the objectives of the project have been met. On state and federally managed lands or other areas where grazing plans exist, ensure utilization criteria are not exceeded. As soon as utilization levels are met, livestock should be moved to other areas (other pastures, etc.). Ensure that AUMs track with declining forage abundance.	Northern Leopard Frog Western Toad American Bittern Black Tern Long-billed Curlew Trumpeter Swan White-faced Ibis Franklin's Gull Sandhill Crane
	Limit duration of grazing activities to avoid habitat degradation	Grazing pressure relief should not be based on length of time but rather on habitat condition	Northern Leopard Frog Western Toad American Bittern Black Tern Long-billed Curlew Trumpeter Swan White-faced Ibis Franklin's Gull

Objective	Strategy	Recommended Action(s)	Target SGCNs
			Sandhill Crane

Water management altering hydrograph

In the Overthrust Mountains Section, hydrograph as well as flow direction of Grays Lake has been altered, resulting in a loss of flow into the Willow Creek System. Hydrologic modification to Grays Lake began when Clark's Cut was completed to drain the basin to the south in 1924 and the natural north outlet blocked by a water control structure. The current water drawdown schedule requires rapid drawdown of water from May 10 to June 24 each year. This annual spring drainage and drawdown removes all but 0.5 feet of water and compels this water level to be maintained through the summer and early fall. The unnatural hydroperiod causes this large montane wetland basin to go dry in many years. Impassable culverts and dewatering for irrigation has resulted in a loss of connectivity between wetland systems. In recent years, predation at nesting colonies has become a significant concern in some locations for White-faced Ibis and Franklin's Gull (*Leucophaeus pipixcan*). For some species, increased predation is directly related to low water levels. IDFG staff has documented concerning White-faced Ibis and Franklin's Gull predation at Oxford Slough WPA during ibis banding activities. USFWS unsuccessfully attempted to determine the predator, using remote cameras in subsequent years. The predator(s) and reason for their sudden interest in, and access to, the colony remain unknown.

Water supply, management, and allocation in the west are dominant themes for waterbird conservation. While these themes have innumerable aspects, the Pacific Flyway Nongame Technical Committee and their partners, including the Intermountain West Joint Venture, identified an assessment of wetland connectivity across the Pacific Flyway as an important first step (Pacific Flyway Council 2015).

Objective	Strategy	Recommended Action(s)	Target SGCNs
Maintain/restore natural wetlands in the proper functioning condition.	Work with private landowners and land managers to identify opportunities for increasing the availability of suitable natural wetlands for foraging White-faced Ibis.	Work with partners, such as Ducks Unlimited, to identify areas within 20 km of the colonies that were historically classified as natural wetlands and have hydrological potential for restoration. Work with Land Trusts to determine opportunities for restoration on private lands with high hydrological potential for restoration	Northern Leopard Frog Western Toad American Bittern Black Tern Long-billed Curlew Trumpeter Swan White-faced Ibis Franklin's Gull Sandhill Crane
Increase breeding habitat availability for American Bittern.	Manage key wetlands to benefit this species	Work with land managers, such as USFWS, to develop wetland management actions that would benefit this species Conduct targeted surveys on managed lands to determine if actions taken are having the intended impact.	American Bittern
Determine source and level of predation within the waterbird colony at Oxford	Conduct research at Oxford Slough to determine if observed	Work with FWS to develop predation assessment project on the WPA	White-faced Ibis Franklin's Gull

Objective	Strategy	Recommended Action(s)	Target SGCNs
Slough WPA	predation on White-faced Ibis and Franklin's Gulls within the colony is limiting this population		
Increase breeding habitat availability for Black Terns	Restore and protect key marsh habitats, particularly in northern Idaho	Assess status of recently suitable habitat, and explore opportunities for restoring and protecting these habitats.	Black Tern

Unknown status or causes of decline

Multiple species identified as SGCN are declining as a result of unknown causes. The priority for many of these species in the coming years is to identify what is/are the root cause(s) of their apparent decline, and develop a strategy for addressing it.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Determine current distribution and abundance of American Bitterns	Participate in coordinated monitoring Identify hot spots for conservation	Conduct repeat surveys of effort initiated in early 2000s to determine where species distribution and density has changed.	American Bittern

Conversion from flood-irrigated habitat to center-pivot irrigation

Over the past two decades, there has been an alarming trend in water use conversion. Since 1995, flood irrigated habitats (FIHs) in the Intermountain West have declined by 23% (*123,000 acres/year*) while sprinkler irrigated acres have increased correspondingly. This conversion may reflect the direct, unidirectional loss of potential wetland habitat for wildlife. 16% of those FIHs have been converted to Center-Pivot sprinkler irrigation. Sprinkler irrigation techniques dramatically reduce the amount of standing or flowing surface water on fields making them less attractive as foraging habitat for wetland birds. Aside from the direct loss of habitat to birds and other wildlife, this trend may have negative implications for watershed resiliency affecting fisheries, flood-plain fragmentation, and tolerance of climatic variability. Throughout the West, the conversion to sprinkler irrigation has been incentivized through federal programs, including the USDA Farm Bill programs, for perceived water use efficiencies. However, studies have indicated that incentivizing sprinkler conversion may not provide the intended or perceived water savings, economic return, or environmental benefits. Typically sprinkler irrigation originates as a groundwater withdrawal with virtually no groundwater return or input, while flood-irrigation imparts surface withdrawal resulting in a groundwater input. The latter is more representative of historical floodplain hydrologic processes. The loss of FIHs is of particular concern within 20 km of White-faced Ibis breeding colonies, as it threatens the viability of Ibis in Idaho (C. Colson, pers. comm).

Objective	Strategy	Recommended Action(s)	Target SGCNs
Maintain flood-irrigated habitats	Work with the Natural Resources	Work with NRCS to develop and/or promote flood irrigation initiatives through the Regional	White-faced Ibis Sandhill Crane

Objective	Strategy	Recommended Action(s)	Target SGCNs
within 20 km of White-faced Ibis breeding colonies.	Conservation Service (NRCS) on incentives to maintain flood agriculture.	Conservation Partnership Program (RCPP). Work with NRCS to develop a flood irrigation enhancement for the Conservation Stewardship Program (CSP). Work with Ducks Unlimited and other NGOs to conduct habitat projects that encourage retention of flood-irrigation habitat. Use Habitat Improvement Program (HIP) funding to leverage funds to encourage retention of flood-irrigated habitat. Work with U.S. Fish and Wildlife Service to determine if Partners for Wildlife funding may be used to help private landowners wanting to provide flood irrigated lands for wildlife.	Franklin's Gull Long-Billed Curlew
Determine acreage of flood irrigated habitat needed to sustain healthy breeding populations of white-faced ibis and other wetland-dependent species.	Work with partners to develop a west-wide assessment of flood-irrigation needs for wildlife.	Work with Pacific Flyway Nongame Technical Committee and Western Working Group of Partners in Flight to develop and implement assessment.	White-faced Ibis Franklin's Gull

Target: Bat Assemblage

Declines in bat populations at both continental and local levels have led to concern about the future of migratory and resident bats in Idaho (Ellison et al. 2003). Insectivorous bats are difficult to study because of their small size and nocturnal, volant behavior, making conservation and management of bats more challenging than many other mammals (Kunz and Racey 1998). Additionally, bats are vulnerable to rapid declines in abundance because of their low reproductive rates and specialized behaviors (O'Shea and Bogan 2003). Reasons for declines are many: habitat loss, modification, and fragmentation; roost site disturbances; wind turbine-caused mortality; pesticides; and emerging pathogens have all been implicated (Kunz et al. 2007, Baerwald et al. 2008). Declines in abundance of bats could have far-reaching consequences, as bats help to maintain functional ecosystems (Kunz et al. 2011) and provide economic benefits to Idaho's agricultural industry (e.g., pest insect control) in excess of $300 million (Boyles et al. 2011).

There are at least 45 species of bats that occur in North America, and 14 insectivorous species have been documented in Idaho (O'Shea and Bogan 2003). Five species of bats have been designated as SGCN. Tier 2 species include Hoary (*Lasiurus cinereus*) and Silver-haired Bat (*Lasionycteris noctivagans*), and Tier 3 species include Little Brown Myotis (*Myotis lucifugus*), Western Small-footed Myotis (*M. ciliolabrum*), and Townsend's Big-eared Bat (*Corynorhinus townsendii*). All five SGCN bats occur in the Overthrust Mountains Ecological Section.

There is an abundance of roosting habitat for bats in the Overthrust Mountains including abandoned mines, caves, forests, and anthropogenic roosts. Minnetonka Cave occurs in this Ecological Section. Minnetonka Cave is Idaho's largest and most popular show cave, with >33,000 tourists visiting each summer. Species found within the cave include those that are potentially the most vulnerable to White-nose Syndrome (WNS). This site is a hibernaculum for SGCNs such as Little Brown Myotis, Western small-footed myotis and Townsend's Big-eared Bat.

Western small-footed myotis in Niter Ice Cave, Southeast Idaho © David Kampwerth

Target Viability

Fair to good. The main concerns to bat conservation in the Overthrust Mountains include introduction of WNS, fatality associated with wind energy facilities, Abandoned Mine Land closures, and roost disturbance. Adjacent Sections to Overthrust Mountains have multiple wind energy facilities that have been shown to cause direct mortality of Silver-haired and Hoary Bat. Because of the volume of out-of-state tourists, Minnetonka cave is a potential introduction site for WNS in Idaho. Although measures are employed to reduce the risk of spreading WNS fungus at Minnetonka Cave, this site remains a high priority for WNS surveillance.

Prioritized Threats and Strategies for Bat Assemblage

Very High rated threats to Bat Assemblage in the Overthrust Mountains

White-nose syndrome

The most recent emerging threat to species of bats in Idaho is White-nose syndrome (WNS), a disease that is causing significant declines in abundance of bats that hibernate in caves and abandoned mines in the eastern United States and Canadian provinces. WNS is caused by a conspicuous white fungus, *Pseudogymnoascus* (formerly *Geomyces*) *destructans* (*Pd*), which invades and erodes skin tissue, causing hibernating bats to arouse more frequently and prematurely deplete fat reserves, resulting in nearly 100% mortality of infected individuals (Cryan et al. 2010). WNS and/or the presence of *Pd* has been confirmed in 26 states and 5 Canadian provinces and will likely continue spreading to other areas in North America in the near future. Species of bats in Idaho that could be most affected by this disease include Little Brown Myotis (Tier 3 SGCN), Western small-footed myotis (Tier 3 SGCN), Long-eared Myotis (*Myotis evotis*), Big Brown Bat (*Eptesicus fuscus*), Canyon Bat (*Parastrellus hesperus*), and Townsend's Big-eared Bat (Tier 3 SGCN), however all species that hibernate in the state are considered vulnerable to WNS.

Townsend's Big-eared Bats in Niter Ice Cave, Southeast Idaho © David Kampwerth

Objective	Strategy	Recommended Action(s)	Target SGCNs
A standard method for addressing conservation of bats in the face of westward spread of WNS	Develop strategic plan for WNS in Idaho	Work with partners and stakeholders to develop a statewide strategic plan for WNS; including protocols for surveillance and response to the introduction of the disease in Idaho	Little Brown Myotis Western small-footed myotis Townsend's big-eared bat
Gather baseline data on presence and relative abundance of bats in Idaho before WNS enters the state	Survey and monitor bat populations in Idaho	Conduct hibernacula surveys every 2 years at known hibernacula to monitor population trends Conduct non-invasive counts at known maternity colonies Conduct standard, repeatable surveys across the landscape to monitor trends in activity and to locate previously unknown maternity colonies/important habitats for bats	Little Brown Myotis Western small-footed myotis Townsend's big-eared bat
Minimize the risk of WNS spreading to Idaho bats to the greatest extent possible	Follow established national protocols (USFWS 2012)	Use of clothing, footwear, and gear that was previously used in a confirmed or suspected WNS-affected state or region is prohibited in Idaho Appropriate decontamination of clothing,	Little Brown Myotis Western small-footed myotis Townsend's big-eared bat

Objective	Strategy	Recommended Action(s)	Target SGCNs
		footwear, and gear is required prior to entry and after exit of any Idaho cave or mine Choose caving gear that can be effectively decontaminated; if gear cannot be effectively decontaminated, dedicate that gear to a specific site	
	Educate the public on the importance of bats and the threat of WNS	Disseminate educational materials to partners, stakeholders, media, interested public Participate in educational presentations on bats, WNS, and clean caving Develop relationships with local caving grottos to encourage involvement in WNS surveillance, bat counts, educational programs, etc.	Little Brown Myotis Western small-footed myotis Townsend's big-eared bat Hoary Bat Silver-haired Bat
Early detection of *Pd* and WNS	Follow national protocols for targeted WNS surveillance (USGS 2015)	Prioritize sites for WNS surveillance program Collect swab samples from bats at priority hibernacula for *Pd* testing Collect samples from substrates within priority hibernacula for *Pd* testing Report and investigate suspicious mortality of ≥ 10 bats; collect dead and/or dying bats to submit for *Pd* testing	Little Brown Myotis Western small-footed myotis Townsend's big-eared bat

High rated threats to Bat Assemblage in the Overthrust Mountains

Wind Energy Development

Wind-energy development is expanding rapidly across the western US, and research has documented alarming mortality of bats at these facilities (Arnett et al. 2008, Cryan and Barclay 2009, Cryan 2011). Idaho currently rates 17th overall for installed wind capacity, at 973 megawatts (MW; AWEA 2014), a surprising 30% increase from 2012. The potential exists for additional development of wind energy in Idaho, which could negatively affect bats that use these lands. Species of bats in Idaho that are killed at wind-energy facilities are predominantly Hoary Bat (Tier 2 SGCN), Silver-haired Bat (Tier 2 SGCN), and Big Brown Bats. Because bats are long-lived with low reproductive potential, increased mortality is likely unsustainable and could result in the loss of entire colonies, loss of benefits to the agriculture industry, as well as additional state and/or federal listings. Currently, no continental-scale monitoring programs have been developed to assess bat fatalities at wind-energy facilities (Boyles et al. 2011); however, unprecedented numbers of bats have been killed (Cryan and Barclay 2009, Cryan 2011).

Objective	Strategy	Recommended Action(s)	Target SGCNs
Develop the best solutions for protecting bats as well as providing	Cooperation between IDFG and wind energy companies	Establish a wind energy working group in Idaho between IDFG and wind energy companies and other stakeholders	Hoary Bat Silver-haired Bat

Objective	Strategy	Recommended Action(s)	Target SGCNs
alternative forms of energy			
Gather baseline data on presence and relative abundance of bats in Idaho	Survey and monitor bat populations in Idaho	Conduct standard, repeatable surveys across the landscape to monitor trends in activity and to locate previously unknown maternity colonies/important habitats for bats	Hoary Bat Silver-haired Bat
Obtain public support for bat conservation	Educate the public on the importance of bats and the effects of wind energy on bats	Disseminate educational materials to partners, stakeholders, media, interested public Participate in educational presentations on bats and wind energy	Hoary Bat Silver-haired Bat

Target: Pollinators

Pollinators provide an essential ecosystem service which benefits agricultural producers, agricultural consumers, and gardeners (Mader et al. 2011) in the Overthrust Mountains. Monarchs and five bees (Hunt's Bumble Bee, Morrison Bumble Bee, Western Bumble Bee, Suckley Cuckoo Bumble Bee, Mason Bee [*Hoplitis producta subgracilis*]) comprise the group of six SGCN pollinators which are known to occur within this ecological section.

Many pollinators, but particularly bees, are known to be experiencing population declines throughout North America and those declines may be occurring within the Overthrust Mountains as well. Population declines and local die offs occur for a variety of reasons including habitat loss, pesticide exposure, and climate change (Mader et al. 2011). Farmers, habitat mangers, roadway authorities, municipalities, and homeowners can all contribute to pollinator conservation in clear and productive ways.

Target Viability

Fair. Many pollinators are declining range-wide. Declines in pollinator populations can be traced to a multitude of causes, such as intensive agricultural practices, use of certain pesticides, and habitat loss and degradation (NRC 2007). Some species such as bumblebees and honeybees have experienced declines as a result of the spread of pathogens and disease from commercially produced colonies to native populations (NRC 2007). Climate change is also expected to provide additional challenges to pollinator populations, ranging from disruption of migratory paths of pollinators such as hummingbirds and bats, to decoupling of plant-pollinator interactions when plants and pollinators respond differently to climate cues.

Prioritized Threats and Strategies for Pollinators

Very High rated threats to Pollinators in the Overthrust Mountains

Pesticides

Pollinators are negatively affected by pesticides through absorption, drinking nectar containing pesticides, and carrying pollen laced with pesticides back to colonies (Mader et al. 2011).

Neonicotinoids are particularly harmful to bee populations and can cause dramatic die-offs (Hopwood et al. 2012). While the most effective pollinator benefitting strategy is to eliminate pesticide use, significant benefit for pollinators can still be achieved through reducing use of, and pollinator exposure to, pesticides (Mader et al. 2011).

Objective	Strategy	Recommended Action(s)	Target SGCNs
Reduce native pollinator exposure to pesticides	Educate habitat managers, farmers, municipalities, and small property owners in methods to eliminate pesticide use	Conducted educational activities which encourage potential pesticide applicators to eliminate use of pesticides where practical. Where pesticides must be used encourage applicators to apply the minimum amount of chemical necessary and apply when pollinators are least active (i.e. nighttime and when flowers are not blooming). Specifically target urban homeowners in educational efforts in the elimination of or proper application of pesticides. Conduct workshops which discuss pesticides in relation to other pollinator habitat management concerns (Mader et al. 2011).	Hunt's Bumble Bee Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee *(Hoplitis producta subgracilis)*
Reduce native pollinator exposure to pesticides on IDFG administered property.	Implement measures to reduce or eliminate pesticide use on IDFG WMAs and other properties.	Use the minimum recommended amount of pesticide. Apply pesticides at times when pollinators are least active such as nighttime, cool periods, low wind activity, and when flowers are not blooming. Mow or otherwise remove flowering weeds before applying pesticides (Mader et al. 2011).	Hunt's Bumble Bee Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee (*Hoplitis producta subgracilis*)
Eliminate use of neonicotinoid insecticides.	Education measures on the detrimental effects of neonicotinoids on bees.	Develop and distribute educational material. Distribute to municipalities, counties, agriculture producers, habitat managers, and other property owners. Do not employ the use of neonicotinoids on IDFG administered lands (Hopwood et al. 2012).	Hunt's Bumble Bee Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee (*Hoplitis producta subgracilis*)

Habitat loss

Pollinators require foraging and nesting habitat. Providing both types of habitat within close proximity to each other is the best way to ensure pollinator success. Protecting, enhancing, and creating pollinator habitat can be a fun and rewarding way to engage with local communities. Educating land managers about techniques to reduce land management impacts to pollinators is an essential component to pollinator habitat management.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Reduce impact of land	Educate about and implement	Reduce grazing impacts by limiting grazing to one third to one fourth of	Hunt's Bumble Bee Morrison Bumble Bee

Objective	Strategy	Recommended Action(s)	Target SGCNs
management practices on pollinators.	practices which benefit pollinators.	management areas per season. Implement pollinator beneficial mowing techniques including use of flushing bar, cutting at ≤8 mph, maintaining a high minimum cutting height of ≥12–16 inches, mowing only in daylight hours, mow in a mosaic instead of an entire site. Where prescribe fire is used, implement pollinator friendly burning protocols including rotational burning of ≤30% of each site every few years, leave small unburned patched intact, avoid burning too frequently (no more than every 5–10 years), avoid high intensity fires unless the burn goal is tree removal. Work with Idaho Department of Transportation to implement proper roadside pollinator habitat management (Mader et al. 2011).	Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee *(Hoplitis producta subgracilis)* Monarch
Conserve existing pollinator habitat.		Map existing major known pollinator habitat. Identify and recognize landowners providing pollinator habitat and provide habitat management educational opportunity. Conduct surveys for native milkweed. Initiate seed saving program (Mader et al. 2011).	Hunt's Bumble Bee Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee *(Hoplitis producta subgracilis)* Monarch
Create new urban and rural pollinator habitat.	Develop programs to encourage urban landowners to create pollinator habitat.	Provide pollinator habitat workshops for homeowners and rural land owners. Provide other educational materials for homeowners. Provide an incentive program for homeowners to create pollinator habitat in urban yards. Add pollinator habitat to IDFG regional office landscaping across the state. Work with municipalities and businesses to create urban pollinator habitat. Provide bee nest boxes for purchase at IDFG regional offices.	Hunt's Bumble Bee Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee *(Hoplitis producta subgracilis)* Monarch

High rated threats to Pollinators in the Overthrust Mountains

Species designation, planning and monitoring

Actions to enhance pollinator habitat will be most effective with knowledge of the current status of SGCN populations. Initiation of long term monitoring will allow a continuous data stream to assess conservation activities.

Objective	Strategy	Recommended Action(s)	Target SGCNs
Determine pollinator population status	Conduct surveys and implement long term pollinator monitoring program.	Conduct surveys to identify colonies and breeding locations of bee SGCN. Protect known breeding sites.	Hunt's Bumble Bee Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee *(Hoplitis producta subgracilis)*
Climate monitoring	Monitor climate variables and species co-occurrence over time	Develop climate monitoring program using a variety of micro-climate variables along with co-occurrence of associated SGCN.	Hunt's Bumble Bee Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee Mason Bee (Hoplitis producta subgracilis)

Overthrust Mountains Section Team

An initial version of the Overthrust Mountains Section project plan was completed for the 2005 Idaho State Wildlife Action Plan (formerly Comprehensive Wildlife Conservation Strategy). A small working group developed an initial draft of the Section Plan (Miradi v. 0.31), which was then reviewed by a wider group of partners and stakeholders during a 2-day workshop held at the Idaho Department of Fish and Game Southeast Regional Office, Pocatello, Idaho in January 2015 (this input was captured in Miradi v. 0.34). That draft was then subsequently distributed for additional stakeholder input including a half-day meeting in February 2015. Since then, we have continued to work with key internal and external stakeholders to improve upon the plan and develop this document. Individuals, agencies, and organizations involved in this plan are listed in Table 9.3.

Table 9.3 Individuals, agencies, and organizations involved in developing this plan[a]

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[a] Apologies for any inadvertent omissions.
[b] An asterisk "*" denotes team leader(s) and contact point if you would like to become involved in this work.

Literature Cited

Bartos, D. L. in Hood, S. M., Miller, M., editors. 2007. Fire ecology and management of the major ecosystems of southern Utah. Gen. Tech. Rep. RMRS-GTR-202. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 110 p. Available online at: http://www.fs.fed.us/rm/pubs/rmrs_gtr202.pdf

Brinson et al. 1995– From Chris Murphy's descriptions

Caribou-Targhee National Forest [CTNF]. 2003. Revised Forest Plan for the Caribou National Forest.

Cordell HK, Carter JB, G Green and M Owens. 2005. Off-highway vehicle recreation in the United States, regions and states: a national report from the National Survey on Recreation and the Environment. USDA, Forest Service, Southern Research Station. Athens, Georgia.

Cox, M., D. W.Lutz, T. Wasley, M. Fleming, B. B. Compton, T. Keegan, D. Stroud, S. Kilpatrick, K. Gray, J. Carlson, L. Carpenter, K. Urquhart, B. Johnson, and C. McLaughlin. 2009. Habitat Guidelines for Mule Deer: Intermountain West Ecoregion. Mule Deer Working Group, Western Association of Fish and Wildlife Agencies. Available Online at: http://www.muledeerworkinggroup.com/Docs/IMW_Mule_Deer_Habitat_Guidelines.pdf

Dahl TE. 1990. Wetlands--losses in the United States, 1780's to 1980's. USFWS Report to Congress, Washington, DC.

East Idaho Aspen Working Group [EIAWG]. 2014. Aspen Toolbox: Tools, techniques and commonsense guidelines for promoting, restoring, and managing aspen on the landscape. Available at http://www.eiawg.org/uploads/AspenToolbox4-11-2014.pdf

Gallant, A. L., Hansen, A. J. IN: Johns S. Councilman, Duane K. Monte and David W. Betz 2003. Vegetation Dynamics Under Fire Exclusion and Logging in a Rocky Mountain Watershed, 1856-1996. Ecological Applications 13(2):385-403.

Halterman, M., M. J. Johnson, J. A. Holmes and S. A. Laymon. 2015. A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo: U.S. Fish and Wildlife Techniques and Methods, 45 p.

Heath SR, EH Dunn and DJ Agro. 2009. Black tern (Chlidonias niger). The Birds of North America Online. (A Poole, editor). Ithaca: Cornell Lab of Ornithology. [revised 2009 Jun 03; accessed 2015 Jun 01]. http://bna.birds.cornell.edu/bna/species/147. doi:10.2173/bna.147.

Idaho Department of Fish and Game [IDFG]. 2014. Management plan for the conservation of wolverines in Idaho. Idaho Department of Fish and Game, Boise, USA.

Idaho's Yellowstone Grizzly Bear Delisting Advisory Team [IYGBDAT]. 2002. State of Idaho Yellowstone Grizzly Bear Management Plan to accompany HCR 62. State of Idaho, Boise, USA.

Kay, Charles E. 2001. The Condition and Trend of Aspen Communities on BLM Administered Lands in Central Nevada – with Recommendations for Management. Final Report to Battle Mountain Field Office, Bureau of Land Management. Battle Mountain, Nevada.

Kunkel, K. E., L. E Stevens, S. E. Stevens, L. Sun, E. Janssen, D. Wuebbles, K. T. Redmond, and J. G. Dobson. 2013. Regional climate trends and scenarios for the U.S. national climate assessment, Part 6. Climate of the Northwest U.S. NOAA Technical Report NESDIS 142- 6, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC.

Lowther P, AF Poole, JP Gibbs, S Melvin and FA Reid. 2009. American Bittern (*Botaurus lentiginosus*), The Birds of North America Online (A. Poole, Ed.). Ithaca (NY): Cornell Lab of Ornithology

Merigliano 1996 – From Chris Murphy's descriptions

National Resource Council. 2007. Status of Pollinators in North America. Washington, D.C.: The National Academies Press

Pierce, D. W., and D. R. Cayan. 2013. The uneven response of different snow measures to human-induced climate warming. Journal of Climate 26:4148–4167.

Ratti JT and JA Kadlec. 1992. Concept plan for the preservation of wetland habitat of the intermountain west--North American Waterfowl Management Plan. USFWS, Portland, Oregon. Shepperd, W. D., D. Binkley, D. L. Bartos, T. J. Stohlgren, and L. G. Eskew, compilers. 2001. Sustaining Aspen in Western Landscapes: Symposium Proceedings; 13–15 June 2000; Grand Junction, CO. Proceedings RMRS-P-18. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 460 p. Available online at: http://www.fs.fed.us/rm/pubs/rmrs_p018.pdf

U.S. Fish and Wildlife Service [USFWS]. 2007. Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area. Available at http://www.fws.gov/mountain-prairie/species/mammals/grizzly/Final_Conservation_Strategy.pdf